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A LONGITUDINAL AND COMPARATIVE STUDY OF
SELECTED PERSONALITY VARIABLES FOR
UNDERGRADUATE STUDENTS IN
A FACULTY OF EDUCATION

by



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A THESIS

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "A Longitudinal and Comparative Study of Selected Personality Variables for Undergraduate Students in a Faculty of Education," submitted by James Marvin Weseen in partial fulfilment of the requirements for the degree of Master of Education.

ABSTRACT

The study examined five personality variables of a group of 105 students in the Faculty of Education at the University of Alberta. It sought to determine both changes from first year to fourth year, and comparative results of sub-groups of fourth year students about to enter the teaching profession. Of the five personality variables four were derived from the Omnibus Personality Inventory, namely Thinking Introversion (TI), Theoretical Orientation (TO), Estheticism (ES), and Social Introversion (SI); and one, Professional Attitude (PA), was based on a scale developed by Ratsoy. The five variables concern, respectively, a preference for abstract and reflective thought, a preference for scientific methods, a preference for artistic activities, a preference for avoiding relationships with people, and a degree of agreement with policies of a teachers' professional organization.

Longitudinally, the group as a whole increased in TI, TO, and PA, and decreased in SI. For TI, different degrees of change were noted between sub-groups based on age at university entrance, marital status, socio-economic status, size of hometown, university average, major subject area, and preferred grade level for teaching. For TO, differences were found on all of these except size of hometown and major subject area, and were found on the basis

of sex as well. For ES, virtually no sub-group showed any change, and for SI differences were noted based only on age at university entrance, marital status, and size of hometown. For PA, virtually all sub-groups increased.

Cross-sectionally in fourth year, TI tended to be higher for those of lower socio-economic status, for those of higher average marks, and for those who preferred higher grade levels. TO tended to be higher for males, for those of lower socio-economic status, for those with mathematics or science majors, and for those who preferred higher grade levels. ES tended to be higher for females and for those with non-science majors. PA tended to be higher for those who entered university at an older age, and for married students. No differences were found on SI in fourth year.

The differential results and changes were tentatively attributed partly to the general culture and previous experiences in it, partly to the effects of the university environment, partly to the students' program or to associations derived from it, and partly to biographic differences.

A number of practical applications of the findings were suggested, particularly to the areas of training and placement of teachers.

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Chapter 1

NATURE OF THE STUDY

INTRODUCTION

Studies of college students by means of various instruments and techniques have demonstrated that numerous personality changes do occur while the individual is in attendance at an institution of higher learning. The present study was restricted to a consideration of five personality variables of students in a four-year teacher training program. An attempt was also made to distinguish among certain subgroups with regard to these variables. The five variables selected for study represented intellectual, social, and professional attributes, three areas with which a professional preparation program might be particularly concerned.

A study such as this has relevance for several groups. Administrators and faculty involved with teacher training may obtain a better idea of the nature of their students, and tailor their programs more closely to individual needs. Students may gain a better picture of themselves and their peers. Persons concerned with the planning of public education may know better what to expect from their teachers. Professional organizations may better be able to plan in-service and development activities. The concern of all of these groups, and of society in general,

with the improvement of education at all levels justifies a study such as the present one which attempts to discover more about those who will be teachers.

Specific justification for research of this particular type lies in the shortage of longitudinal studies of the same students over time. For example, Ratsoy (1965:198) had this to say:

. . . attitude change is occurring so that the teaching candidate who leaves after four years of teacher education holds attitudes different from those held as a freshman. However, in recognition of the weaknesses which underlie a cross-sectional survey, this conclusion is highly tenuous and requires confirmation or rejection by evidence from a longitudinal study. The present study [Ratsoy's] might usefully provide base-line data for such a study.

In the present study, Ratsoy's data have served as base-line data for a longitudinal analysis, as suggested.

THE PROBLEM

The five variables studied include four general, empirically derived factors from a personality inventory, and one generalized attitude toward professional policies of Alberta teachers. The four personality inventory factors include one social variable--degree of interest in relating to other people--and three intellectual variables: degree of liking for reflective thought and abstract ideas, degree of interest in scientific activities and methods, and degree of interest in varied artistic matters and activities.

The problem was stated as follows: which of the five personality variables undergo change as students pass

through a four-year teacher preparation program, and what is the final result?

LIMITATIONS OF THE STUDY

A basic limitation lay in the fact that only education students were tested, and hence the study was restricted to a description of their characteristics. No comparative base existed for determining whether the changes which occurred were associated with the teacher-training program, or with attendance at university, or merely with increase in age or some other factor.

A second limitation was imposed by the nature of the biographic data and by the small sample size. Ordinal data such as were obtained are not amenable to statistical manipulation whereby the effects of interrelated variables on each other can be controlled for, as can be done in stepwise regression analysis or partial correlation. The alternative is to sub-group the data and analyze sub-groups separately, which is greatly restricted when sample size is small. Hence the effects of individual biographic variables on the test results could only be determined in isolation from one another.

A third limitation lay in the fact that the test instrument was administered at the beginning and the end of the students' program, but at no time between. Hence, while total changes were identifiable, no means existed for determining the stage, if any, at which they occurred

most rapidly.

A fourth limitation was that at least some of the changes discovered are likely to have been the result of limited test reliability, rather than actual personality variations.

DELIMITATIONS AND ASSUMPTIONS

The study was deliberately restricted to students who proceeded directly through the four-year Bachelor of Education program at the University of Alberta, beginning in 1964 and finishing in 1968. It was further restricted to a consideration of five particular test variables, and eight biographic items. The assumption was made that the instrument gave valid and accurate measurements of the variables being studied. An assumption was also made that the results were generalizable to students in subsequent versions of the same or a similar program.

NATURE OF THE VARIABLES

Biographic Items

Eight biographic items were used as bases for subgrouping the respondents in this study. Three were descriptive of the individual himself: age, sex, marital status. Two were concerned with the individual's general background: socio-economic status of family, and size of town where grade twelve was completed. Three described the individual's educational background and plans:

cumulative university average, major subject area, and grade level preferred in teaching.

The Omnibus Personality Inventory (OPI)

Of the five personality variables measured, four were drawn from the OPI, a collection of well-validated and reliable personality scales designed particularly for research with college populations. Background characteristics and other information may be found in the Omnibus Personality Inventory--Research Manual (1962). Heist (1968:218-219), one of the developers of the Inventory, gave this general description of its nature:

The chief approach to assessment in an inventory of this type is based on the assumptions that all or most persons in a particular society or culture acquire or develop a number of psychological characteristics in common, but that the diversity of genetic contributors and environmental experiences lead to great variation in the development of these characteristics. Since this is the case, it is also assumed that the scales (measuring devices) can be constructed, with satisfactory validity, to tap the different degrees to which a characteristic exists. The measured characteristics, sometimes referred to as personality dimensions, are represented in ways or styles of thinking, in general orientations to things, events or persons in the environment, in feelings or emotional expressions, and in perceptions about oneself. These ways of thinking or perceiving are verbally expressed in the form of attitudinal statements, opinions, preferences, and interests to which a person is asked to respond, indicating whether or not they describe or typify him in these respects. A specific scale is composed of a related set of such statements . . . which are focused on a measurable characteristic, such as . . . feelings of introversion. Each statement in an item or scale serves as a sample of behavior or an indicator of the overall characteristic. The number of statements responded to, according to the keyed scoring, serve as a measure of the degree of intensity to which the characteristic exists in comparison with the average score obtained on a large, representative sample of

students. Thus, any score represents a relative and not an absolute measurement.

Derived as they are by factor analytic techniques, the personality variables are purely empirical in nature. Nevertheless, their predictive value in a number of studies (see Chapter 2) justifies their existence and use.

Because of the prohibitive length of the total inventory, and because of a desire to concentrate on certain personality dimensions only, four scales were chosen which had a number of favourable qualities. In factor analysis described in the Research Manual (1962:26-27), three of them loaded heavily on a factor termed Scholarly Orientation, and the remaining one was the sole scale in a factor called Social Introversion. These general areas seemed appropriate for a study of prospective teachers. In addition, the four scales had relatively high reliabilities and low overlap of items, and contained no items of a threatening nature. The factors measured by these scales are described in the Research Manual (1962:4-6) as follows.

Thinking Introversion (TI) (60 items): Persons scoring high on this measure are characterized by a liking for reflective thought, particularly of an abstract nature. They express interests in a variety of areas, such as literature, art, and philosophy. Their thinking tends to be less dominated by objective conditions and generally accepted ideas than that of thinking extroverts (low scorers). Extroverts show a preference for overt action and tend to evaluate ideas on the basis of their practical, immediate application.

Theoretical Orientation (TO) (32 items): This scale measures interest in science and in scientific activities, including a preference for using the scientific method in thinking. High scorers are generally logical, rational, and critical in their approach to problems.

Estheticism (ES) (24 items): The high scorers endorse statements indicating diverse interests in artistic matters and activities. The content of the statements in this scale extends beyond painting, sculpture, and music and includes interests in literature and dramatics.

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Social Introversion (SI) (54 items): The high scorers withdraw from social contacts and responsibilities. They display little interest in people or in being with them. The social extroverts (low scorers), on the other hand, seek social contacts and gain satisfaction from them.

Professional Attitude (PA)

The remaining personality variable consists of a generalized attitude toward professional policy of the Alberta Teachers' Association. The scale, intended for use with prospective Alberta teachers, was developed by Ratsoy (1965), who called it the Education Profession Attitude Questionnaire.

ADDITIONAL TERMINOLOGY

Most of the specialized terms used in the study concern the variables under consideration, and as such they have already been described. A few terms, however, remain.

Personality

As used in the present study, personality consists of a number of general factors shared by all individuals, but in varying amounts; and of individual attitudes, drives, motives and characteristics not common to everyone.

Personality Variable

The term "personality variable" is used generally to refer to any of the five variables Thinking Introversion, Theoretical Orientation, Estheticism, Social Introversion, and Professional Attitude.

Change

A change in any variable is operationally defined as a statistically significant change in mean score on the scale for that variable, for the whole group or for any sub-group identified on the basis of the biographic items.

SUMMARY

This chapter attempted to outline the nature of the study described in this thesis. A general justification for the undertaking was given, with emphasis on practical applications. The problem was delineated, and the limitations of the study outlined. The boundaries of the study and the assumptions implicit in interpreting the results were stated. Following this, a description of the approximate nature of the variables under consideration was given, in order to provide a better idea of what the study was seeking to measure. Finally, three additional terms basic to the study were operationally defined.

Chapter 2

RELATED LITERATURE

In an area of study as nebulous and as general as "personality" or "personality change," the quantity of relevant research and literature is very large. Any attempt to encompass it would result in either an inadequate summary or a prohibitively long discussion. Consequently, a decision was made to delimit rather sharply the number and scope of items included in this review. Major emphasis is given to those articles and studies which involved the instruments used in the present study: four scales of the Omnibus Personality Inventory (OPI) and the Professional Attitude scale (PA). Other items of research and report are mentioned only if they have direct relevance to the present study or if they are considered to have some particularly important feature.

RESEARCH

In the following study, the various studies are described individually in order to render their findings more coherent. First, the OPI research is considered, followed by a brief description of the results of the one study which used the PA scale.

Research with the Omnibus
Personality Inventory

Normative studies. The original group of studies using the OPI was the series carried out under the auspices of the Center for the Study of Higher Education (now the Center for Research and Development in Higher Education) at Berkeley, the developers of the OPI, for the purpose of developing a normative sample. Concerning the nature of the normative group (N=2390) the authors, in the Omnibus Personality Inventory--Research Manual (1962:8), had this to say:

Since it was impossible to draw a random, representative sample of college students distributed across institutions of higher education, it was decided to use the scores of a large number of freshmen (a) who represented a great amount of heterogeneity on several characteristics, and (b) whose mean academic ability score was at least equivalent to or above the national average for college students. The incoming students in two large public institutions, the University of California at Berkeley and San Francisco State College, met the above criteria much more adequately than student samples available from other colleges and universities. Students from both institutions cover an extensive range of socioeconomic backgrounds and a great variety of vocational goals. The distribution of their mean ability scores is typical of students enrolled in public higher education.

The results of administering the OPI to the group described revealed the following means and standard deviations for the four scales of interest here: Thinking Introversion--mean 34.8, SD 9.5; Theoretical Orientation--mean 18.8, SD 5.2; Estheticism--mean 11.5, SD 5.0; Social Introversion--mean 20.7, SD 8.8.

Cross-sectional studies. The majority of cross-sectional studies surveyed dealt with correlates of intellectual ability; in addition one dealt with creativity, and one with a number of biographic factors.

Warren and Heist (1960) discovered that in a college sample (N unknown), gifted students compared with average students as follows: gifted students, both males and females, scored significantly higher on Thinking Introversion, Theoretical Orientation, and Estheticism, while gifted males alone scored significantly lower on Social Introversion. In addition, gifted females scored significantly higher than their male counterparts on Thinking Introversion; and females in general had higher Estheticism scores than did males.

As a follow-up to the Warren and Heist study, Gottsdanker (1968) combined a comparison of ability groupings with a comparison of the sexes in a stratified random sample of 300 university freshmen. Gifted students in general were found to have significantly higher scores than average students on Thinking Introversion, Theoretical Orientation, and Estheticism; no significant difference was found on the Social Introversion scale. However, comparisons on the basis of sex as well as ability indicated that no significant differences existed between gifted and average males, while gifted females were significantly higher than average females on Thinking Introversion, Theoretical Orientation, and Estheticism. As well, comparisons based

on sex alone showed females to be significantly higher on Estheticism.

Dispenzieri et al (1967) examined the responses on selected OPI scales of 247 business school freshmen grouped on the basis of both aptitude (as per aptitude test score) and academic achievement (as per grade-point average). They found that high-aptitude students scored significantly higher than students of average aptitude on Thinking Introversion and Theoretical Orientation; on Estheticism and Social Introversion no significant differences were noted with respect to aptitude. When scores on the four OPI scales were compared for students grouped on the basis of academic achievement, no significant differences were noted on any of the scales. An additional finding was that when compared with the normative sample for the OPI, the business school sample scored significantly lower on Thinking Introversion, Theoretical Orientation and Estheticism, and significantly higher on Social Introversion.

Brown (1968) used parts of the OPI in a comparison of the intellectual activity (based on reported reading, discussion, and other "intellectual" pursuits) and academic achievement of 390 college freshmen. Indices of intellectual activity were found to have a low ($p < 0.25$) but significant correlation with Thinking Introversion, Theoretical Orientation, and Estheticism, while academic achievement showed a significant correlation only with Theoretical Orientation. Furthermore, intellectual activity did not correlate significantly with

academic achievement.

Extensive use was made of the OPI by its developer, the Center for Research and Development in Higher Education at Berkeley, in a series of studies of creative college students in the United States. Heist (1969) reported that creativity was found to be identifiable by a set of above-average scores on seven OPI scales, among which were Thinking Introversion, Theoretical Orientation, and Estheticism. Creative students were distinguishable from scholarly non-creatives by the creative students' somewhat lower scores on the first two scales and considerably higher scores on the third. One of the major findings of the research was that creative students tended to drop out of all college programs proportionally more often than non-creative students. Also indicated was a positive relationship between Thinking Introversion score and ability but not achievement.

The final cross-sectional study surveyed was that of Ratsoy (1965), who used four OPI scales in an examination of 1983 prospective and experienced teachers in attendance at a Faculty of Education. In comparison with normative data, he found no significant differences in means or standard deviations, with the exception of the mean score on Theoretical Orientation, which was lower in his sample. Comparisons based on sex indicated the following significant results: a higher score for males than females on Theoretical Orientation; a higher score for females than males on

Estheticism; a higher Thinking Introversion score for male than female elementary teachers and candidates. Comparisons based on marital status indicated that married students scored significantly higher than single students on Thinking Introversion and Theoretical Orientation. Comparisons based on age indicated that older students scored higher on Thinking Introversion and Theoretical Orientation, and lower on Social Introversion. Comparisons based on socio-economic status found that students with higher self-estimates of socio-economic level scored higher on Thinking Introversion and Estheticism, and lower on Social Introversion. Comparisons based on grade level taught or aspired to showed secondary school teachers, and particularly vocational teachers, scoring higher on Thinking Introversion and Theoretical Orientation, and lower on Estheticism, than elementary school teachers. Comparisons based on subject major showed humanities majors scoring highest on Thinking Introversion and Estheticism, and lowest on Theoretical Orientation; the opposite was found for science students. Comparisons based on teaching experience indicated that experienced teachers scored higher on Thinking Introversion, Theoretical Orientation, and Estheticism. Comparisons based on academic achievement revealed that high achievers scored higher on these three scales as well. Comparisons based on length of training indicated that a longer teacher training period was accompanied by higher Thinking Introversion and Theoretical Orientation scores, and lower Social Introversion

scores, with males being more responsible for the first of these results, and females for the last. Finally, comparisons based on type of program pursued indicated that those who had come into Education after gaining a degree from another faculty scored higher on Theoretical Orientation and Social Introversion than did those who had their background in Education, with females being primarily responsible for the former result.

Longitudinal studies. Three longitudinal studies were reviewed. The first, by Stewart (1964), examined 289 students in a four-year university liberal-arts program. He found that neither males nor females changed significantly in Theoretical Orientation, both sexes increased in Estheticism, and females alone increased in Thinking Introversion and decreased in Social Introversion. An analysis of the underlying factor structure of the scales indicated that the meaning of the four scales had not changed significantly over the four-year period.

A brief mention of a longitudinal analysis is made by Heist (1968), who reports that a sample of students (N unknown) at the Massachusetts Institute of Technology showed a general decrease in Thinking Introversion over a four-year course of study.

The third longitudinal study was done by Elton and Rose (1968), who carried the use of the OPI one step further than usual. In a study of seventy-six college students in

several programs, they accepted the findings of earlier researchers that change in score does in fact occur, and sought instead the characteristics of the changes. They used a factor analytic technique on individual differences in a change score, with two significant factors resulting. A factor termed Humanistic Thinking loaded heavily on change scores in Thinking Introversion and Estheticism, and accounted for 21 percent of the variance. A factor called Interpersonal Rationality loaded positively on Social Introversion changes and negatively on Theoretical Orientation changes, and accounted for 9 percent of the variance. In addition, no significant differences were noted in the type of change undergone by males in liberal arts, commerce, and engineering.

Research with the Professional Attitude Scale

Only one study has been done using the PA scale, namely that of Ratsoy (1965), who developed the instrument. In a sample of 1983 prospective and experienced teachers, he found the following significant results: males scored higher than females in general, and in elementary teaching areas but not in secondary teaching areas; older respondents scored higher than younger respondents; experienced teachers scored higher than those with no experience; teachers training for secondary, especially vocational, positions scored higher than those training for elementary positions; those with a longer period of training scored higher than those with a shorter period of training, and those who took all their training in the Faculty of Education scored higher than those who took a first degree in another area. No significant differences were found on the basis of marital status,

socio-economic level, subject major, or academic achievement.

Discussion

The relatively few studies which have made use of any of these instruments makes generalization rather risky, but a number of findings are consistent in several of the studies. On the Estheticism scale, for example, females are repeatedly found to score higher than males. On both Thinking Introversion and Theoretical Orientation, respondents with higher intellectual ability consistently score higher than respondents with lower intellectual ability.

In other areas where two or more studies have been done, however, the findings are less consistent. Three studies found Thinking Introversion to be unrelated to academic achievement while one found a direct relationship. Two studies found Theoretical Orientation to be directly related to academic achievement while one found no relationship. Two studies found Estheticism to be unrelated to academic achievement, while one found a direct relationship. Two studies found Estheticism to be directly related to intellectual ability, while one found the relationship to hold only for females, and another found no relationship at all. One study found males to be higher than females on Thinking Introversion, while another found the reverse to be true in the case of gifted individuals. On the remaining variables no basis exists for comparison, since they have been dealt with in one or fewer studies reported to date.

CHANGING PERSONALITY FACTORS

While the research outlined above indicates a number of personality differences and changes which may occur, there is little indication of which results are deemed most desirable, nor of how changes might be brought about. The present section briefly attempts to deal with these topics as they are discussed in the literature, with particular reference to the training of teachers.

Desirable Traits

A study such as the present one which is oriented to practice must take some account of the desirability of certain teacher traits and changes in them in terms of the accepted goals of education. Ratsoy (1965:1) said, "The teacher's personality is a significant variable in the classroom; it may be the most significant variable." Henjum (1969:143) supported this in saying " . . . the teacher's personality characteristics constitute an important variable in determining the nature of the teacher-pupil interaction." On the other hand, Knill (1963) reported that research indicates that teachers are a minor reference group for students, and Friesen (1966) found that teachers rank below parents and peers in influencing student values. Nevertheless, certain teacher traits are of importance even if the teacher is seen merely as a purveyor of subject matter. Especially in the case of a number of the characteristics examined in the present study, the

individual's personality may have a decided effect on the manner, the efficiency, and the effectiveness with which a given subject is presented. As Cox (1960:89) said,

. . . the teacher's attitude will limit in a very real way her progress in learning to teach. It will determine the kinds of modifications that she is willing to attempt in her teaching; the energy with which the changes are pursued and the learning that takes place.

Because of the universal criterion of objectivity, however, few researchers have committed themselves to a position regarding the personality factors examined in the present study. An exception is Stewart (1964:214) who, having found an increase in Thinking Introversion, Theoretical Orientation and Estheticism, and a decrease in Social Introversion, for college students over a four-year period, stated ". . . the apparent changes are similar to those . . . that one might wish for as an outcome of a college education." Another tentative commitment in the area of Theoretical Orientation was made by Anderson (1965:208), who despite reservations about which values should be taught in schools, concluded,

. . . nevertheless [the teacher] is professionally dedicated to the teaching of instrumental values . . . which are based on reality and the instruments which have enabled man to make sense of it. Outstanding among these values are scientific methods

In the area of Social Introversion, Henjum (1969:146) concluded that particularly at a junior high level (as opposed to senior high) it was important to a student teacher's success that he be extroverted and sociable.

Another implied commitment to a position might be

that of the Alberta Teachers' Association, from whose policies the Professional Attitude scale was constructed. Certainly a higher score on this scale, indicating a closer agreement with Association policies, would be deemed desirable by that organization.

In view of the low probability of there being universal agreement on either the effects of teacher personality or the particular personality traits desired, it might be best merely to present the variables considered in this study as a series of "if-then" statements. If a tendency to abstract thought and interest in a wide variety of areas of thought is felt to be desirable in teachers, then a higher Thinking Introversion score will also be deemed desirable. If, on the other hand, a preference for action, practicality, and extreme objectivity is seen as desirable, then a lower Thinking Introversion score will be approved. If a preference for science and scientific methods, and a high degree of problem-solving skill are seen as desirable, then a higher Theoretical Orientation score will be desired. If a general interest in artistic and humanistic matters is desired in a teacher, then a higher Estheticism score will be approved. If creativity in teachers is desired, then a high score on all of Thinking Introversion, Theoretical Orientation, and Estheticism will also be seen as desirable (cf. Heist, 1968). If a desire for and a satisfaction with social contacts, and a general interest in people, is seen as a desirable trait, then a lower Social

Introversion score will be desired as well. Finally, if a high degree of agreement with stated policies of the teaching profession is desired, then a higher Professional Attitude score will be approved also.

Preferences for various combinations of the above choices are likely to vary between individuals, and are likely to adopt different degrees of importance depending on such other conditions as the subject area and the grade with which the teacher will be working.

Causing Changes to Occur

While the process of selection itself may allow some leeway in obtaining teachers with desired combinations of personality traits, the method is rather haphazard. An alternative solution was provided by Del Popolo (1965:52):

If teaching is . . . a function of the teacher's personality, then emphasis should be placed on the direction and modification of personality trends during the period of preparation and later during actual teaching service.

An immediate problem that would have to be solved in this situation, however, is the reaching of sufficient consensus regarding desirable changes to allow a concerted effort to be made. Furthermore, though changes apparently occur, whether they can be produced or guided is an issue which has as yet not been resolved, but which must also be considered.

Effects of college. Numerous studies have been made regarding the effects of a college program on producing

changes in personality and attitude. Lehmann et al (1966:89-90) gave the following summary:

Contradictory evidence has been presented regarding the impact of college on student attitudes and values (Jacob, 1957; Lehmann & Dressel, 1963; Newcomb, 1943; Webster, 1958). At the same time, data have indicated that from the freshman to senior years changes in attitudes and values will occur (Jacob, 1957; Lehmann & Dressel, 1963; Newcomb, 1943; Plant, 1962; Webster, Freedman and Heist, 1962), but that the degree and extent to which attitudes and values are modifiable depend upon the nature of the experience (Smith, 1955), the type and nature of contact (McGuigan, 1958), the personality makeup of the individual (Helson, Blake, Mouton, & Olmstead, 1956), the group's approval of new attitudes (Rosenberg, 1956), and the subject's perception of the outcome (Carlson, 1956). Although the importance of the college climate in changing attitudes and values of college students is apparent in the works of Eddy (1957, 1959), Brown and Bystrym (1962), Lazure (1959), and Newcomb (1962), it has been found to be nearly impossible to single out any one factor as being responsible for college students' attitudes and value changes (Lehmann & Payne, 1963).

Recent research has not solved the controversy.

Mazer (1969:119) concluded that "The attitudes and personal values and constructs of student teachers can be significantly modified through training programs." Kirchner and Hogan (1968:352) concluded that ". . . a future teacher is a future teacher as far as value patterns . . . are concerned."

Cohen (1968:19), on the basis of a fairly extensive review of literature, concluded:

The general consensus of opinion is that what students learn in college is to a very large extent determined by the system of values, attitudes, and norms for their behaviour which are generated in the peer group culture or the specific sub-groupings within it.

Research by Elton and Rose (1968) and by Brown (1968) indicated that changes in selected OPI personality variables

of university students may occur more as a result of what goes on outside the classroom than what goes on within it. These studies seem to be representative of the large number in the area, in that it is apparent from all of them that no definite conclusion may be drawn as to the effect of a college program as such on the personality changes which occur concurrent with it.

Techniques. Generalized effects of a college program aside, it still remains a possibility that a concerted effort could be made by a college, an individual instructor, or an in-service training committee to modify certain attitudes or personality factors of a group of teachers or prospective teachers. Again, however, conflicting evidence exists as to the likelihood of success. In the area of Estheticism, for example, Harris (1966) pointed out that the process of developing esthetic awareness and appreciation is a long and complex process, and must be begun in childhood if it is to last. Yet Diffily (1966) made an exhaustive survey of the attitude-change research on the premise that a significant and lasting change in esthetic response can be induced in a properly conducted university course. Evidence provided by Padgett (1967), Alberti (1967), and others, that changes of various types can be produced in the duration of a single university course, is somewhat inconclusive due to the fact that no follow-up was made, and in cases where follow-up was done, for example McEwin (1968) the changes were found to be largely transitory.

The possibility of requiring student teachers to take certain courses, for example art appreciation courses and science laboratory courses, in order to change their esthetic and theoretical viewpoints respectively, was given some degree of support by Ratsoy (1965). In a cross-sectional study he found that science students in fourth year had higher Theoretical Orientation scores than did those in first year, while their Estheticism scores showed little difference; the reverse was true for humanities students. Nevertheless, the possibility of previous inclinations or reference group effects rather than the nature of the courses as the determining factor cannot be excluded.

Numerous theories, suggestions, and research findings in the field of social psychology are available for the individual who wishes to attempt to modify personality factors and attitudes. A number which give a broad view of the area and which were based on the premise that attitude and personality change can be produced, may be mentioned. Newcomb et al (1965) gave a good introduction to attitudes and attitude change. Kiesler et al (1969) gave an excellent outline of theories of attitude change, and a comprehensive summary of research in the area. Other good works in the same area include Sherif et al (1965) and Insko (1967). In the area of teacher education, Diffily (1966) and Stang (1967) gave fairly extensive and practical summaries of research which might be applicable to teacher training. A number of other references may be found in the bibliography of this thesis.

SUMMARY

This chapter was concerned with a survey of relevant literature. First, a summary was presented of the research which has been done using the same instruments as were used in the present study, namely the Omnibus Personality Inventory scales called Thinking Introversion, Theoretical Orientation, Estheticism, and Social Introversion; and the Professional Attitude Scale. This was followed by a brief discussion of the desirability and importance of the different personality factors in teachers, and a consideration of how desired personality changes might be produced, either environmentally or by design.

Chapter 3

METHODOLOGY

INSTRUMENT

The instrument used to obtain the data for the present study was one designed by Ratsoy (1965) for studying attitudes of prospective teachers. Called the Education Student Attitude Inventory, it consists of four parts, three of which were used partly or in full in the present study: Part A, which asks for biographic data; Part B, which contains 160 true-false items from which are obtained the Thinking Introversion, Theoretical Orientation, Estheticism, and Social Introversion scores; and Part C, which contains twenty items from which is obtained the Professional Attitude score. Appendix A of this thesis contains the questionnaire comprising Part C. The items of the four OPI scales were not included in the Appendix due to copyright; they may be found in the Omnibus Personality Inventory which is readily available. Relevant questions from Part A are described below.

Biographic Variables

The questionnaire items from which the eight biographic variables were obtained were worded as follows.

Age. The item stated "Age - CHECK ONE." Five

alternatives were provided: under 18, 18 or 19, 20 or 21, 22 to 25, over 25.

Sex and marital status. These two variables were combined into one question: "Sex and Marital Status - CHECK ONE." The six choices were: single male; single female; married male; married female; separated, divorced or widowed male; separated, divorced or widowed female.

Socio-economic status. The item stated "Compared with the families of other university students, do you consider the socio-economic level of your family to be: CHECK ONE." The five alternatives were: considerably lower, somewhat lower, same, somewhat higher, considerably higher.

Size of town where grade twelve was completed. This information was obtained from the item which stated "Completed Grade XII in - CHECK ONE." The choices provided were: Edmonton, Calgary, another Alberta city, Alberta town, Alberta village, Alberta rural school, city or town outside Alberta, village or rural school outside Alberta.

Cumulative university average. This item was worded "Your cumulative university average (or grade XII average if in your first year) is." Eight choices were provided: under 55, 55-59, 60-64, 65-69, 70-74, 75-79, 80-84, 85 and over.

Major subject area. The item asked "What is (or will be) your major field of concentration? CHECK ONE: (If you have more than one field, check the one you are

most interested in.)" The fifteen choices were as follows: English, foreign language, social studies, mathematics, biological sciences, chemistry, physics, fine arts, physical education, industrial arts, home economics, early childhood education, libraries, education of exceptional children, other (specify).

Grade level preferred in teaching. This question asked "What grade level are you most interested in teaching?" The eight alternatives were: kindergarten, primary (1-3), intermediate (4-6), junior high (7-9), senior high (10-12), junior college, university, other (specify).

Personality Variables TI, TO, ES, SI

These variables are based on scores which were obtained by summing the "correct" answers to certain selected items. The items were presented as 160 statements to which the respondent could answer T if he felt the statement was true or mostly true for him, or F if he felt the statement was false or not usually true for him. The items for the four scales were presented in a mixed order, and were worded such that the "correct" answer was sometimes T and sometimes F.

Professional Attitude Scale PA

The scale from which this score was obtained is included in Appendix A. It consists of twenty items to be responded to on a five-point scale ranging from Strongly

Agree to Strongly Disagree. The items are drawn from the policy statements of the Alberta Teachers' Association, but a number of them are worded so as to be antithetical to the stated policies. All but these latter items are scored in reverse, so that on the scale as a whole a higher score is indicative of a more positive professional attitude.

DATA COLLECTION

In the fall of 1964, as part of a large cross-sectional study being done by Ratsoy, the Education Student Attitude Inventory was administered to all available first-year students in the Faculty of Education at the University of Alberta. The 799 respondents constituted well over 90 percent of the total first-year enrollment.

In the spring of 1968 the Inventory was administered once again, to all education students present in certain classes which are normally compulsory in the fourth year of the undergraduate program. Two hundred seventy-six responses were obtained.

SAMPLE

Examination of both sets of questionnaires revealed that 111 students had responded in both 1964 and 1968. Of these, six had not been in first year initially, and had been away from university in the interval, as classroom teachers. The remaining 105 had been first-year students in 1964, were fourth-year students in 1968, and had attended

continuously in the interim period. As a consequence, they held no degree, and had no teaching experience. These students formed the longitudinal sample used in the present study.

ANALYSIS

The analysis of the data involved certain initial methodological considerations, followed by preliminary treatment of the data to facilitate handling, followed by statistical analysis. Each of these steps is discussed separately below.

Initial Considerations

Since each respondent completed the biographic items each time the questionnaire was administered and since some items were subject to change, a decision was required as to which set of biographic information to use. In the case of socio-economic status of family, major subject area, and grade level preferred in teaching it was decided that the response given in fourth year was more likely to be accurate. In the case of cumulative university average, the fourth-year response was the logical choice. In the case of marital status, the fourth-year response was chosen because very few respondents were married in first year. Sex, not being subject to change, was arbitrarily taken from the fourth-year responses. In the case of age, the nature of the question and the possible responses provided necessitated the choice of first-year data. Finally, for the item concerning the

size of town where grade twelve was completed, it was felt that first-year responses were more likely to be accurate.

Preliminary Treatment

The completed questionnaires were scored by computer, and each person's total scores for the personality variables were punched on IBM cards along with the biographic data. One complete card was punched for each respondent for each administration of the test. Subsequent treatment, using the University of Alberta's IBM 360/67 computer, transferred the appropriate biographic data and the paired personality variable scores (first year and fourth year) to one card per respondent, for ease of analysis.

Statistical Analysis

Two major types of statistical comparison were required. For the longitudinal aspect of the study, the mean scores in first year and in fourth year for each of the five personality variables had to be compared, both for the whole group and for the various sub-groups based on biographic variables. For the cross-sectional aspect of the study, the mean scores on each variable for the mutually exclusive biographic sub-groups had to be compared.

Tests. For the first type of comparison (longitudinal), the correlated t test suggested by Ferguson (1966:169-171) was chosen. For the second type of comparison (cross-sectional), the Analysis of Variance was chosen, to be followed by the Scheffé "Comparison of Means Following an

F-test" in cases where more than two sub-groups were being compared. This method of analysis also was suggested by Ferguson (1966:296-297).

Level of significance. The a priori level of significance was set at 0.05 for all t-tests and F-tests. For the Scheffé "Comparison of Means," the high degree of rigour involved in the test was taken to justify a significance level of 0.10 following a significant F ratio. This is as suggested by Scheffé (1959) and by Ferguson (1966:297).

Assumptions underlying the tests. Both of the tests chosen are based on the assumptions that the distribution of responses in the groups compared does not differ significantly from normality, and that the variance of the responses is not significantly different in the groups compared. To ensure that these assumptions were met by the data, tests of goodness-of-fit to the normal curve and of homogeneity of variance were applied to all sub-groups. Where the assumptions were found not to have been met (again using a .05 level of significance), adjustments were made in the tests to account for this fact, using methods suggested by Ferguson (1966:173-174), Lindquist (1953:73-86), and Pearson and Hartley (1958:26-27; Tables 136-137).

Biographic sub-groups. In the comparisons involving sub-groups, the small sample size necessitated reducing the number of sub-groups from that provided by the questionnaire

in several cases, so that each one would have sufficient members to make meaningful comparisons possible. The final sub-groups for each of the eight biographic variables were as follows. Age in Year 1 was reduced to three: under 18, 18-19, and over 19. Sex remained at two: male and female. Marital Status remained at two: married and single. Socio-Economic Status of Family was reduced to three sub-groups: lower than that of other university students, same as that of other university students, and higher than that of other university students. Size of Town Where Grade Twelve Was Completed was reduced to three: city, town, and village-rural. Cumulative University Average was reduced to three: below 65, 65-69, and above 69. Major Subject Area was reduced to two: mathematics-science and non-mathematics-science. Grade Level Preferred in Teaching was reduced to three: kindergarten-primary-intermediate, junior high, and senior high or higher. The response frequency for each of these sub-groups is indicated in the appropriate table in Chapter 4, and the original response frequencies (before combination) may be obtained from Appendix B, Transformed Data.

Method of analysis. The appropriate statistical tests were made using the IBM 360/67 computer, and programs prepared by the Division of Educational Research Services, University of Alberta. Where the assumptions of the various tests were not met by the data, appropriate corrections were made.

SUMMARY

This chapter was concerned with a description of the methodology involved in the study. The nature of the instrument was described, and the administration of it to a large sample of education students was discussed. The method used to arrive at the final sample of 105 respondents was indicated. Finally, the analysis was discussed, including both preliminary considerations and the statistical techniques employed.

Chapter 4

FINDINGS

In this chapter the results of statistical analysis of the data are presented and discussed. For the convenience of those who wish the information, results which were found significant at the .01 level are presented in the tables as such, even though the .05 level was the criterion for significance throughout the statistical analysis. Results which were not significant at the .05 level are labelled NS.

The problem which this study sought to answer asked "which of the five personality variables undergo change as students pass through a four-year teacher preparation program, and what is the final result?" The data are presented first for the group as a whole, and then for the comparative sub-groups based on the eight biographic variables. The description which accompanies each table indicates both significant longitudinal changes and significant differences between sub-groups at each of Year 1 and Year 4, where applicable.

Since in many cases the abbreviations TI, TO, ES, SI, and PA are used for the variables Thinking Introversion, Theoretical Orientation, Estheticism, Social Introversion, and Professional Attitude, a fold-out page has been provided in Appendix C to which reference may be made for the full name and a brief description of each variable.

THE WHOLE GROUP

When analysis was conducted on the data from the group as a whole to determine whether either the mean score or the variance of scores had changed significantly from Year 1 to Year 4, the results were as indicated in Table 1. Four of the scales showed a significant change in mean score, with TI, TO and PA increasing significantly and SI decreasing significantly. The ES scale alone showed no significant change over the four years. None of the five scales showed a significant change in variance.

Table 1

Comparisons of Means and Variances between Year 1 Responses and Year 4 Responses on Five Scales for All Respondents*

| | TI | TO | ES | SI | PA |
|--------------|------|------|------|------|------|
| Year 1 Mean | 33.7 | 17.4 | 11.5 | 22.0 | 66.3 |
| Year 4 Mean | 36.5 | 18.4 | 11.2 | 20.5 | 72.8 |
| Significance | .01 | .05 | NS | .05 | .01 |
| Year 1 Var. | 72.0 | 25.0 | 19.6 | 68.1 | 32.1 |
| Year 4 Var. | 75.6 | 32.9 | 23.2 | 70.0 | 30.1 |
| Significance | NS | NS | NS | NS | NS |

*N = 105

BIOGRAPHIC SUB-GROUPS

In order to discover more specific correlates of

the various indicated changes in personality factors, and to determine more accurately the nature of the group with respect to the five factors, the group was subdivided on the basis of each of the eight biographic variables in turn. In addition to the examination of changes within sub-groups, comparisons were made between sub-groups as well, for each of the five personality variables. The results are presented in this section for each of the eight sets of comparisons in turn, beginning with the three "individual" biographic variables, followed by the two "general background" variables, and then the three "educational background and plans" variables.

In each of the tables in this section containing the results of analysis of a single biographic variable, the results of longitudinal and cross-sectional comparisons of means are presented simultaneously, for each of the five personality variables. For any given personality variable in the tables, the Year 1 and Year 4 means for each biographic sub-group are shown. The probabilities or significances given on the right in each case are for the cross-sectional comparisons of the different sub-groups in Year 1 and in Year 4; where more than two sub-groups are compared, the specific pairs which differed significantly (at the .10 level for the Scheffé comparison following an F test significant at .05, as per the discussion on page 32) are indicated. The probabilities or significances at the bottom are for the longitudinal comparisons within each sub-group, to indicate whether a significant change in

score occurred between Year 1 and Year 4.

Age in Year 1

Age in Year 1 was analyzed in three sub-groups, "Under 18," "18-19," and "Over 19." The rather small size of the first and last of these (fourteen and sixteen respectively) may increase somewhat the likelihood of errors of the second type, in that rather large observed differences are required for statistical significance. The results are as indicated in Table 2. The youngest sub-group was the only one not to show a significant increase in both Thinking Introversion and Professional Attitude. On the other hand, it was the only sub-group showing a significant change, a decrease, in Estheticism. The oldest sub-group was the only one with a significant increase in Theoretical Orientation, while the middle sub-group was the only one with a significant decrease in Social Introversion. In addition, on Professional Attitude, where both older groups increased significantly, the oldest group showed a greater increase, such that in Year 4 their average scores were significantly higher than those of the middle age group.

Sex

The results for male-female comparisons are as indicated in Table 3. Both groups increased significantly in Thinking Introversion and Professional Attitude, and neither group showed a significant change in Estheticism or Social Introversion. In Theoretical Orientation males alone

Table 2a

Between-Group and Longitudinal Comparisons of
Respondents Grouped on the Basis of Age
in Year 1* for Scales TI, TO, ES

| | TI | | | | TO | | | | ES | | | |
|---------|------|------|------|--------------------|------|------|------|---------------------|------|------|------|--------------------|
| | Gp.1 | Gp.2 | Gp.3 | Sig.diff. pairs | Gp.1 | Gp.2 | Gp.3 | Sig. diff. pairs | Gp.1 | Gp.2 | Gp.3 | Sig.diff. pairs |
| Year 1 | 32.3 | 33.2 | 37.4 | none | 16.1 | 17.6 | 17.3 | none | 11.7 | 11.3 | 11.9 | none |
| Year 4 | 36.1 | 35.7 | 40.9 | none | 17.6 | 18.4 | 19.5 | none | 9.3 | 11.4 | 12.3 | none |
| Signif. | NS | .01 | .05 | | NS | NS | .01 | | .05 | NS | NS | |

*The groups are: Group 1--Under 18 (N= 14)
Group 2--18-19 (N= 75)
Group 3--Over 19 (N= 16)

Table 2b

Between-Group and Longitudinal Comparisons of
Respondents Grouped on the Basis of Age
in Year 1* for Scales SI, PA

| | SI | | | | PA | | | |
|---------|------|------|------|--------------------|------|------|------|--------------------|
| | Gp.1 | Gp.2 | Gp.3 | Sig.diff. pairs | Gp.1 | Gp.2 | Gp.3 | Sig.diff. pairs |
| Year 1 | 22.9 | 21.6 | 23.0 | none | 67.3 | 65.9 | 67.6 | none |
| Year 4 | 21.2 | 20.0 | 22.1 | none | 71.1 | 72.4 | 75.9 | 2-3 |
| Signif. | NS | .05 | NS | | NS | .01 | .01 | |

*The groups are: Group 1--Under 18 (N= 14)
Group 2--18-19 (N= 75)
Group 3--Over 19 (N= 16)

increased significantly, so that in Year 4 their score was significantly higher than that of females. The other significant difference between the two sub-groups was in Estheticism, where in both Year 1 and Year 4 females had a higher score.

Marital Status

When students who were married in their fourth year were compared with students who were single, the results were as indicated in Table 4. Married students alone increased significantly in Theoretical Orientation, while single students alone increased significantly in Thinking Introversion and decreased significantly in Social Introversion. Neither sub-group changed in Estheticism, and both sub-groups increased significantly in Professional Attitude. Between-group comparisons indicate that married students were significantly higher in Professional Attitude in Year 4.

Socio-Economic Status of Family

A comparison based on perceived socio-economic status of the student's family in relation to families of other university students yielded results as indicated in Table 5. Three sub-groups were compared. Those who felt that they came from a family lower in socio-economic status than those of their peers, alone showed significant increases in Thinking Introversion and Theoretical Orientation. Neither this sub-group nor the other two sub-groups, those

Table 3a

Between-Group and Longitudinal Comparisons of
 Respondents Grouped on the Basis of Sex*
 for Scales TI, TO, ES

| | TI | | | TO | | | ES | | |
|---------|------|------|------|------|------|------|------|------|------|
| | Gp.1 | Gp.2 | Sig. | Gp.1 | Gp.2 | Sig. | Gp.1 | Gp.2 | Sig. |
| Year 1 | 33.2 | 34.1 | NS | 18.3 | 16.6 | NS | 10.0 | 12.6 | .05 |
| Year 4 | 37.4 | 35.9 | NS | 20.7 | 16.7 | .01 | 9.3 | 12.7 | .05 |
| Signif. | .01 | .05 | | .01 | NS | | NS | NS | |

*The groups are: Group 1--Male (N= 46)
 Group 2--Female (N= 59)

Table 3b

Between-Group and Longitudinal Comparisons of
 Respondents Grouped on the Basis of Sex*
 for Scales SI, PA

| | SI | | | PA | | |
|---------|------|------|------|------|------|------|
| | Gp.1 | Gp.2 | Sig. | Gp.1 | Gp.2 | Sig. |
| Year 1 | 22.1 | 21.9 | NS | 66.6 | 66.1 | NS |
| Year 4 | 19.9 | 21.0 | NS | 73.8 | 72.0 | NS |
| Signif. | NS | NS | | .01 | .01 | |

*The groups are: Group 1--Male (N= 46)
 Group 2--Female (N= 59)

Table 4a

Between-Group and Longitudinal Comparisons of
Respondents Grouped on the Basis of Marital
Status* for Scales TI, TO, ES

| | TI | | | TO | | | ES | | |
|---------|------|------|------|------|------|------|------|------|------|
| | Gp.1 | Gp.2 | Sig. | Gp.1 | Gp.2 | Sig. | Gp.1 | Gp.2 | Sig. |
| Year 1 | 36.1 | 33.1 | NS | 17.8 | 17.3 | NS | 11.9 | 11.4 | NS |
| Year 4 | 38.6 | 36.0 | NS | 19.6 | 18.1 | NS | 10.5 | 11.5 | NS |
| Signif. | NS | .01 | | .05 | NS | | NS | NS | |

*The groups are: Group 1--Married (N=22)
Group 2--Single (N= 83)

Table 4b

Between-Group and Longitudinal Comparisons of
Respondents Grouped on the Basis of Marital
Status* for Scales SI, PA

| | SI | | | PA | | |
|---------|------|------|------|------|------|------|
| | Gp.1 | Gp.2 | Sig. | Gp.1 | Gp.2 | Sig. |
| Year 1 | 21.7 | 22.1 | NS | 65.8 | 66.5 | NS |
| Year 4 | 21.9 | 20.2 | NS | 75.9 | 71.9 | .01 |
| Signif. | NS | .01 | | .01 | .01 | |

*The groups are: Group 1--Married (N= 22)
Group 2--Single (N= 83)

Table 5a
Between-Group and Longitudinal Comparisons of
Respondents Grouped on the Basis of Socio-
Economic Status* for Scales TI, TO, ES

| | TI | | | TO | | | ES | | | | | |
|---------|------|------|------|--------------------|------|------|------|--------------------|------|------|------|--------------------|
| | Gp.1 | Gp.2 | Gp.3 | Sig.diff. pairs | Gp.1 | Gp.2 | Gp.3 | Sig.diff. pairs | Gp.1 | Gp.2 | Gp.3 | Sig.diff. pairs |
| Year 1 | 36.1 | 31.5 | 34.8 | 1-2 | 18.1 | 17.1 | 16.7 | none | 12.4 | 10.4 | 12.0 | none |
| Year 4 | 40.1 | 33.1 | 37.5 | 1-2 | 20.7 | 17.4 | 17.3 | 1-2,1-3 | 11.7 | 10.6 | 11.7 | none |
| Signif. | .01 | NS | NS | | .01 | NS | NS | | NS | NS | NS | |

*The groups are: Group 1--Lower than that of other university students (N= 32)
Group 2--Same as that of other university students (N= 51)
Group 3--Higher than that of other university students (N= 21)

Table 5b

Between-Group and Longitudinal Comparisons of
Respondents Grouped on the Basis of Socio-
Economic Status* for Scales SI, PA

| | | SI | | | PA | | | | |
|---------|--|------|------|------|--------------------|------|------|------|---------------------|
| | | Gp.1 | Gp.2 | Gp.3 | Sig.diff. pairs | Gp.1 | Gp.2 | Gp.3 | Sig. diff. pairs |
| Year 1 | | 22.7 | 22.1 | 20.4 | none | 66.6 | 65.4 | 67.8 | none |
| Year 4 | | 21.3 | 20.6 | 19.1 | none | 72.8 | 73.0 | 72.2 | none |
| Signif. | | NS | NS | NS | | .01 | .01 | .01 | |

*The groups are: Group 1--Lower than that of other university students (N= 32)
Group 2--Same as that of other university students (N= 51)
Group 3--Higher than that of other university students (N= 21)

who estimated their family's socio-economic status to be the same as or higher than that of their peers' families, showed any significant change in either Estheticism or Social Introversion; but all three sub-groups increased significantly in Professional Attitude. Comparisons between sub-groups indicate that the lower socio-economic group were significantly higher in Thinking Introversion than were the middle group, in both Year 1 and Year 4. As well, the lower socio-economic sub-group, being the only one to increase significantly in Theoretical Orientation, were in Year 4 significantly higher than either of the others on that scale.

Size of Town Where Grade Twelve
Was Completed

In the comparison based on size of town where the student completed grade twelve, the three sub-groups showed results as given in Table 6. Village-rural respondents were the only sub-group not to increase significantly in Thinking Introversion; neither they nor city respondents changed significantly in Social Introversion, while town respondents showed a decrease on that scale. None of the sub-groups changed significantly in Theoretical Orientation or Estheticism, while on Professional Attitude all three increased significantly. On this latter scale the village-rural sub-group increased most, in that while in Year 1 they were significantly lower than city respondents, in Year 4 the two groups were not significantly different.

Table 6a

Between-Group and Longitudinal Comparisons of
Respondents Grouped on the Basis of Size of
Town Where Grade Twelve Was Completed*
for Scales TI, TO, ES

| | TI | | | TO | | | ES | | | | | |
|---------|------|------|------|--------------------|------|------|------|--------------------|------|------|------|--------------------|
| | Gp.1 | Gp.2 | Gp.3 | Sig.diff. pairs | Gp.1 | Gp.2 | Gp.3 | Sig.diff. pairs | Gp.1 | Gp.2 | Gp.3 | Sig.diff. pairs |
| Year 1 | 34.2 | 32.2 | 34.5 | none | 17.4 | 16.9 | 17.9 | none | 12.0 | 10.8 | 11.3 | none |
| Year 4 | 37.5 | 36.8 | 34.5 | none | 18.6 | 18.6 | 18.0 | none | 11.7 | 11.1 | 10.5 | none |
| Signif. | .01 | .01 | NS | | NS | NS | NS | | NS | NS | NS | |

*The groups are: Group 1--City (N= 50)
Group 2--Town (N= 29)
Group 3--Village-rural (N= 26)

Table 6b

Between-Group and Longitudinal Comparisons of
Respondents Grouped on the Basis of Size of
Town Where Grade Twelve Was Completed*
for Scales SI, PA

| | SI | | | PA | | |
|---------|------|------|------|--------------------|------|-------------------------------|
| | Gp.1 | Gp.2 | Gp.3 | Sig.diff. pairs | Gp.1 | Gp.2 Gp.3 Sig. diff. pairs |
| Year 1 | 21.2 | 22.7 | 22.8 | none | 67.6 | 65.9 64.3 1-3 |
| Year 4 | 19.8 | 19.5 | 22.9 | none | 73.2 | 72.5 72.2 none |
| Signif. | NS | .05 | NS | | .01 | .01 .01 |

*The groups are: Group 1--City (N= 50)
Group 2--Town (N= 29)
Group 3--Village-rural (N= 26)

Cumulative University Average

Three sub-groups were compared on the basis of self-estimated cumulative university average; those whose average was below sixty-five, those whose average was from sixty-five to sixty-nine, and those whose average was above sixty-nine. The results of the comparison are summarized in Table 7. Both the below-median sub-group and the above-median sub-group increased significantly in Thinking Introversion, while the sub-group whose averages were in the middle range showed no change. Only the highest sub-group increased significantly in Theoretical Orientation. None of the three showed any change in Estheticism or Social Introversion, and all three increased significantly in Professional Attitude. The only difference between the sub-groups was in Year 4 on Thinking Introversion, where those with averages over sixty-nine scored significantly higher than those whose averages were between sixty-five and sixty-nine.

Major Subject Area

Comparison of students whose major subject area was mathematics-science and students whose major was in another area gave results as indicated in Table 8. Mathematics-science students showed no significant change in Thinking Introversion, while non-mathematics-science students increased significantly on that scale. Neither sub-group changed significantly on Theoretical Orientation, Estheticism, or Social Introversion, while both sub-groups increased significantly in Professional Attitude. Comparisons between

Table 7a
Between-Group and Longitudinal Comparisons of
Respondents Grouped on the Basis of
Cumulative University Average*
for Scales TI, TO, ES

| | TI | | | TO | | | ES | | | | | |
|---------|------|------|------|--------------------|------|------|------|--------------------|------|------|------|--------------------|
| | Gp.1 | Gp.2 | Gp.3 | Sig.diff. pairs | Gp.1 | Gp.2 | Gp.3 | Sig.diff. pairs | Gp.1 | Gp.2 | Gp.3 | Sig.diff. pairs |
| Year 1 | 32.5 | 33.5 | 35.1 | none | 16.6 | 17.7 | 17.7 | none | 11.5 | 11.3 | 11.6 | none |
| Year 4 | 35.7 | 34.5 | 37.8 | 2-3 | 17.7 | 18.5 | 19.6 | none | 11.9 | 10.0 | 11.5 | none |
| Signif. | .01 | NS | .01 | | NS | NS | .05 | | NS | NS | NS | |

*The groups are: Group 1--Below 65 (N= 33)
Group 2--65-69 (N= 38)
Group 3--Above 69 (N= 29)

Table 7b

Between-Group and Longitudinal Comparisons of
 Respondents Grouped on the Basis of
 Cumulative University Average*
 for Scales SI, PA

| | SI | | | | PA | | |
|---------|------|------|------|--------------------|------|------|------|
| | Gp.1 | Gp.2 | Gp.3 | Sig.diff. pairs | Gp.1 | Gp.2 | Gp.3 |
| Year 1 | 22.3 | 21.7 | 22.6 | none | 66.6 | 66.1 | 66.0 |
| Year 4 | 21.5 | 19.7 | 20.9 | none | 71.8 | 73.2 | 73.4 |
| Signif. | NS | NS | NS | | .01 | .01 | .01 |

*The groups are: Group 1--Below 65 (N=33)
 Group 2--65-69 (N= 38)
 Group 3--Above 69 (N= 29)

Table 8a

Between-Group and Longitudinal Comparisons of
Respondents Grouped on the Basis of Major
Subject Area* for Scales TI, TO, ES

| | TI | | | TO | | | ES | | |
|---------|------|------|------|------|------|------|------|------|------|
| | Gp.1 | Gp.2 | Sig. | Gp.1 | Gp.2 | Sig. | Gp.1 | Gp.2 | Sig. |
| Year 1 | 33.9 | 33.6 | NS | 20.2 | 16.0 | .01 | 9.7 | 12.3 | .01 |
| Year 4 | 35.5 | 37.1 | NS | 21.5 | 17.0 | .01 | 8.9 | 12.4 | .01 |
| Signif. | NS | .01 | | NS | NS | | NS | NS | |

*The groups are: Group 1--Mathematics-science (N= 34)
Group 2--Non-mathematics-science (N= 71)

Table 8b

Between-Group and Longitudinal Comparisons of
Respondents Grouped on the Basis of Major
Subject Area* for Scales SI, PA

| | SI | | | PA | | |
|---------|------|------|------|------|------|------|
| | Gp.1 | Gp.2 | Sig. | Gp.1 | Gp.2 | Sig. |
| Year 1 | 20.6 | 22.7 | NS | 65.6 | 66.7 | NS |
| Year 4 | 18.6 | 21.4 | NS | 72.8 | 72.7 | NS |
| Signif. | NS | NS | | .01 | .01 | |

*The groups are: Group 1--Mathematics-
Science (N= 34)
Group 2--Non-mathematics-
Science (N= 71)

sub-groups indicate that mathematics-science students scored significantly higher in Theoretical Orientation and lower in Estheticism than their counterparts in other subject areas, in both Year 1 and Year 4.

Grade Level Preferred in Teaching

A comparison of sub-groups based on the grade level the respondent would prefer to teach yielded results which are shown in Table 9. The three sub-groups compared were: those who preferred the kindergarten-primary-intermediate level, those who preferred the junior high level, and those who preferred to teach senior high or higher. The first and last of these groups both showed a significant increase in Thinking Introversion, while the middle group did not change. The senior high group alone increased significantly in Theoretical Orientation. On Estheticism and Social Introversion, none of the three sub-groups changed significantly, while on Professional Attitude all three increased. Comparisons between the three sub-groups show that in both Year 1 and Year 4 the group which preferred senior high were significantly higher in Thinking Introversion than were the group who preferred the elementary grades, while the junior high group fell in between and were thus not significantly different from either of the others. On Theoretical Orientation both the junior high group and the senior high group were significantly higher than the elementary group in Year 1, and in Year 4 all three groups differed significantly, with elementary being the lowest and senior high the

Table 9a
Between-Group and Longitudinal Comparisons of
Respondents Grouped on the Basis of
Grade Level Preferred in Teaching*
for Scales TI, TO, ES

| | TI | | | TO | | | ES | | | | | |
|---------|------|------|------|--------------------|------|------|------|--------------------|------|------|------|--------------------|
| | Gp.1 | Gp.2 | Gp.3 | Sig.diff. pairs | Gp.1 | Gp.2 | Gp.3 | Sig.diff. pairs | Gp.1 | Gp.2 | Gp.3 | Sig.diff. pairs |
| Year 1 | 30.3 | 33.5 | 36.0 | 1-3 | 14.0 | 18.0 | 19.2 | 1-2,1-3 | 11.8 | 11.8 | 11.1 | none |
| Year 4 | 33.6 | 35.5 | 39.1 | 1-3 | 14.6 | 18.0 | 21.2 | 1-2,1-3,2-3 | 12.3 | 11.7 | 10.3 | none |
| Signif. | .01 | NS | .01 | | NS | NS | .01 | | NS | NS | NS | |

*The groups are: Group 1--Kindergarten-primary-intermediate (N= 31)
Group 2--Junior high (N= 26)
Group 3--Senior high or higher (N= 48)

Table 9b

Between-Group and Longitudinal Comparisons of
Respondents Grouped on the Basis of
Grade Level Preferred in Teaching*
for Scales SI, PA

| | | SI | | | PA | | | | |
|---------|--|------|------|------|--------------------|------|------|------|--------------------|
| | | Gp.1 | Gp.2 | Gp.3 | Sig.diff. pairs | Gp.1 | Gp.2 | Gp.3 | Sig.diff. pairs |
| Year 1 | | 23.2 | 22.0 | 21.3 | none | 66.5 | 65.8 | 66.5 | none |
| Year 4 | | 21.6 | 20.3 | 19.9 | none | 72.7 | 72.7 | 72.8 | none |
| Signif. | | NS | NS | NS | | .01 | .01 | .01 | |

*The groups are: Group 1--Kindergarten-primary-intermediate
(N= 31)
Group 2---Junior high (N= 26)
Group 3---Senior high or higher (N= 48)

highest.

DISCUSSION

The Whole Group

The findings as presented on the preceding pages reveal that, as anticipated, certain personality variables (as measured by the scales used in this study) in prospective teachers do undergo change in the process of professional training. Of the five variables considered, four showed a significant change over the four-year training period, for the group as a whole. Thinking Introversion, Theoretical Orientation, and Professional Attitude increased, and Social Introversion decreased. Estheticism alone did not change.

These findings show limited agreement with those of some of the studies described in Chapter 2. Heist (1968) observed a general decrease in Thinking Introversion over a four-year university course in one sample. Stewart (1964) found no change in Theoretical Orientation, but a significant increase in Estheticism in his liberal-arts sample. Neither of these results are in agreement with those of the present study. On the other hand, in a cross-sectional study of prospective and experienced teachers Ratsoy (1965) found that with an increased length of training (and increased age) there appeared to be an increase in Thinking Introversion, an increase in Theoretical Orientation, an increase in Professional Attitude, a decrease in Social Introversion,

and no change in Estheticism. These results are totally in keeping with the present findings. Given that Ratsoy's sample consisted of prospective teachers in the same college environment as the sample used in the present study, the agreement between the two sets of results is understandable.

A comparison of the mean score on each of the tests with means arrived at in other studies is relevant to a discussion such as the present one. In addition to the two sets of means (Year 1 and Year 4) from the present study, mean scores have been provided by the writers of the Omnibus Personality Inventory--Research Manual (1962) for their normative sample, and by Ratsoy (1965) for the sample of prospective and practising teachers. A series of t-tests for the significance of differences between means revealed several differences. Ratsoy's sample, consisting of students from all years of a four-year program, differed from the normative sample of freshmen only on Theoretical Orientation, with the normative sample being higher. The present sample's Year 1 means show a similar result, which is not unexpected due to the fact that the present sample was in Year 1 a portion of Ratsoy's larger sample. Yet even though the present Year 1 means differed from the Year 4 means on four out of five scales, the Year 4 means were significantly different from the normative sample only on Thinking Introversion (normative sample is lower). It must be noted, however, that the Professional Attitude scale was not part of the test battery administered to the normative sample,

and hence no basis for comparison exists on that scale.

Despite the fact that the present sample was in Year 1 a part of Ratsoy's larger sample, a difference did exist; the present Year 1 group was significantly lower in Professional Attitude. Nevertheless, this result is consistent with expectations once again, for both Ratsoy's study and the present one indicated an increase in Professional Attitude score between freshman and senior years; and Ratsoy's sample included students from all levels while the present one was limited to first-year students.

A similar finding resulted when the present Year 4 means were compared with those of Ratsoy's heterogeneous group: the present sample was significantly higher in Thinking Introversion, Theoretical Orientation, and Professional Attitude. Again this is explainable by the fact that the present sample is a somewhat homogeneous group of seniors, and both studies have revealed that seniors score higher than freshmen (who constitute a large portion of Ratsoy's sample) on all three of the scales under discussion. Less consistent with this explanation is the fact that the present Year 4 group did not differ from Ratsoy's sample in Social Introversion, though both studies indicated a significantly lower score on this scale for seniors. A possible explanation for this result is that while there was a significant decrease it was not a large one, and the buffering effect of the seniors in Ratsoy's sample was sufficient to render the difference statistically insignificant.

Biographic Sub-Groups--Longitudinal

In addition to examining the mean scores of the whole sample, the study attempted to compare various sub-groups based on biographic variables. An examination of these findings, both longitudinally and between groups in Year 4, is instructive.

A summary of significant longitudinal results is given in Table 10. Examination of all of them together reveals a number of facts. First and most obvious, the Professional Attitude score was the one which showed the most consistent change. For all biographic sub-groups except one, Professional Attitude increased. There may be several possible explanations for the one exception, the age group which was under eighteen years of age in Year 1, but the most likely is that due to the extreme smallness of the group (fourteen) an error of the second type occurred and the increase which was observed was insufficient to avoid being statistically rejected.

A related and almost equally obvious observation is the lack of change in Estheticism in any of the sub-groups, again with the sole exception of the under-eighteen age group. In this case, however, the smallness of the group is an argument in support of the accuracy of the observed decrease, in that a fairly large decrease in score was required for statistical significance. Yet an examination of the cross-sectional data (Table 2a, page 39) shows no significant difference between the sub-groups in either Year

1 or Year 4. The statistical effects of the rather large differences in size among the sub-groups based on age makes any attempted explanation of the results rather risky; consequently no attempt will be made here.

On the Thinking Introversion scale a moderately large number of sub-groups showed an increase, but the discriminating power of the biographic variables was quite good. This is evident in that only on one variable, sex, could no discrimination be made: both groups increased significantly. In a very general way, it could be said that Thinking Introversion tends to increase more with increased age at university entrance, with single marital status, with lower socio-economic status, with a more urban high school background, and with a non-mathematics-science subject major. In the case of cumulative university average and preferred grade level, no such conclusion may be drawn due to the fact that while the lower and higher extremes both showed a significant increase in Thinking Introversion, the middle group did not.

In the case of Theoretical Orientation, although fewer sub-groups showed a significant increase, general relationships may be suggested for a number of biographic variables. That is, Theoretical Orientation has a tendency to show more increase with increasing age at university entrance, with male sex, with married status, with lower socio-economic status, with high university average, and with preference for teaching higher grade levels.

Table 10

Summary of Significant Longitudinal Results

| Variable | Sub-group | TI | TO | ES | SI | PA |
|-----------------------|-------------------|----|----|-----|----|----|
| Age | Under 18 | .. | .. | D** | .. | .. |
| | 18-19 | I* | .. | .. | D | I |
| | Over 19 | I | I | .. | .. | I |
| Sex | Male | I | I | .. | .. | I |
| | Female | I | .. | .. | .. | I |
| Marital status | Married | .. | I | .. | .. | I |
| | Single | I | .. | .. | D | I |
| Socio-economic status | Lower than peers | I | I | .. | .. | I |
| | Same as peers | .. | .. | .. | .. | I |
| | Higher than peers | .. | .. | .. | .. | I |
| Size of hometown | City | I | .. | .. | .. | I |
| | Town | I | .. | .. | D | I |
| | Village-rural | .. | .. | .. | .. | I |
| Cumulative average | Below 65 | I | .. | .. | .. | I |
| | 65-69 | .. | .. | .. | .. | I |
| | Above 69 | I | I | .. | .. | I |
| Major subject area | Math-science | .. | .. | .. | .. | I |
| | Non-Math-science | I | .. | .. | .. | I |
| Preferred grade level | Elementary | I | .. | .. | .. | I |
| | Junior high | .. | .. | .. | .. | I |
| | Senior high | I | I | .. | .. | I |
| WHOLE GROUP RESULTS | | I | I | .. | D | I |

*I indicates a significant increase.

**D indicates a significant decrease.

Noteworthy is the fact that "Major Subject Area" showed no relation to the increase in Theoretical Orientation. Since this particular personality factor is closely related to a preference for scientific methods of thought, it might be expected that in general mathematics-science majors would show more of an increase than their counterparts in other subject areas, due to an increasing involvement with scientifically oriented courses. Yet this is not demonstrated by the results. However, an examination of the cross-sectional data (Table 8a, page 52) reveals that in Year 1 mathematics-science students were on the average already significantly higher in Theoretical Orientation and they remained higher in Year 4, which seems to suggest that although a difference exists in the two sub-groups based on subject major, the scientific thought pattern is probably set before the student enters the university environment.

The remaining personality factor, Social Introversion, shows little tendency to be affected by biographic variables. Although it decreases significantly for the whole group, it appears to have a clear relationship only to marital status. Social Introversion scores decreased for two other variables, "Age in Year 1" and "Size of Town Where Grade Twelve Was Completed." In both cases the decrease occurs in the middle group alone. Hence no directional relationship may be suggested. Nevertheless, while the "single" and "18-19" groups are rather large and hence may merely be reflecting the general Social Introversion

decrease, the "town" sub-group is somewhat smaller (N=29) and hence its significant decrease in Social Introversion is noteworthy.

An overall examination of the variables in Table 10 reveals that Age in Year 1, despite the uneven numerical distribution of respondents in the sub-groups, is the best single variable for discriminating among the changes in personality variables. It distinguishes between sub-groups on all five scales, while the five next most discriminating variables distinguish sub-groups on only two or three scales, and the remaining two (sex and major subject area) on only one scale.

Finally in the discussion of longitudinal aspects of the study, a comparison may be made of some of the results on the biographic subdivisions, in the present study and in some of the research described in Chapter 2.

The studies described in Chapter 2 concentrated their longitudinal research on the sex variable almost exclusively. Stewart (1964) found that in a general college sample females tended to increase in Thinking Introversion and decrease in Social Introversion, while males did not. Ratsoy (1965) found that among education students males tended to increase more in Thinking Introversion, while females tended to decrease more in Social Introversion. He further found that both sexes in general increased in Professional Attitude, and neither changed in Estheticism. While the findings of these two researchers on Thinking

Introversion are totally in disagreement, perhaps due to differences in the nature of the samples, and on Social Introversion are totally in agreement, the results of the present study support neither one. Both sexes were found in general to increase significantly in Thinking Introversion, and neither sex was found to decrease significantly in Social Introversion. The latter result at least may be due to the smallness of the present sample. The results of the present study do, however, support Ratsoy's findings with respect to Estheticism and Professional Attitude.

Biographic Sub-groups--Cross-Sectional

One concern of this study was with the final result on the personality scales as the respondents neared the end of their teacher training program. Accordingly, the significant differences between various biographic sub-groups in the Year 4 scores are of interest. Table 11 presents this information in summary form.

Of particular interest are the various sub-groups which clearly stand apart from their counterparts on one or more scales. This is of course most obvious in the cases where only two sub-groups exist, but it occurs a number of times on the variables with three sub-groups as well. For example, respondents of lower socio-economic status clearly tend to be higher than either of the other two sub-groups in Thinking Introversion. Also, and even more distinctively, respondents who prefer to teach the various grade levels tend to be significantly different in Theoretical Orientation,

Table 11

Summary of Significant Differences between
Biographic Sub-groups in Year 4

| Variable* | Significant Differences |
|---------------------------|---|
| Age (3) | "Over 19" is higher than "18-19" in Professional Attitude. |
| Sex (2) | "Male" is higher than "Female" in Theoretical Orientation. "Female" is higher than "Male" in Estheticism. |
| Marital status (2) | "Married" is higher than "Single" in Professional Attitude. |
| Socio-economic status (3) | "Lower than peers" is higher than "Same as peers" in Thinking Introversion. "Lower than peers" is higher than "Same as peers" and "Higher than peers" in Theoretical Orientation. |
| Size of hometown (3) | No significant differences. |
| Cumulative average (3) | "Above" is higher than "65-69" in Thinking Introversion. |
| Major subject area (2) | "Math-science" is higher than "Non-math-science" in Theoretical Orientation. "Non-math-science" is higher than "Math-science" in Estheticism. |
| Preferred grade level (3) | "Senior high" is higher than "Elementary" in Thinking Introversion. "Elementary," "Junior high," and "Senior high" are all significantly different in Theoretical Orientation, with "Elementary" being the lowest and "Senior high" the highest. |

*Number of sub-groups is given in parentheses.

with elementary-school-oriented teaching candidates being the lowest, junior high second, and senior high the highest. On the dichotomous variables, males tend to be higher than females in Theoretical Orientation but lower in Estheticism. Married students tend to be higher than single students in Professional Attitude. Mathematics-science students tend to be higher than non-mathematics-science students in Theoretical Orientation, but lower in Estheticism. The similarity in the male-female comparison and the science-nonscience comparison may be at least partly explained by the .38 correlation between sex and major subject area (see Appendix D, which gives Kendall rank order correlations between biographic variables); males tend to go into science, while females concentrate more in other areas. Likewise, the similarity in Theoretical Orientation between prospective high school teachers, males, and science majors; and elementary candidates, females and nonscience majors is a logical follow-up of the correlation which exists between preferred grade level and sex ($-.29$) and preferred grade level and major subject area ($.23$).

Comparison of the results of the present study with the findings of earlier studies (see Chapter 2) is again instructive. The finding regarding female superiority in Estheticism is consistent with the findings of Warren and Heist (1960), Ratsoy (1965), and Gottsdanker (1968). However, Ratsoy's findings that male education students were higher than females in Thinking Introversion and Professional

Attitude are not supported; furthermore his study, unlike the present one, found no difference between the sexes on Theoretical Orientation. Again, in marital status, this study does not support Ratsoy's findings that married education students are in general higher in Thinking Introversion and Theoretical Orientation, but not in Professional Attitude. In socio-economic status, Ratsoy found students of higher status to be generally higher in Thinking Introversion and Estheticism, and lower in Social Introversion, while the present study found some evidence that lower-status individuals were higher in Thinking Introversion and Theoretical Orientation, and not significantly different on the other scales. In the area of university average, findings were mixed regarding the relationship between average and Thinking Introversion, Theoretical Orientation, and Estheticism. The present study supports Ratsoy but not the other researchers in finding that students with higher averages show some tendency to higher scores on Thinking Introversion. It supports Dispenzieri et al (1967) but not Ratsoy (1965) or Brown (1968) in finding no relationship between average and Theoretical Orientation. It supports Dispenzieri and Brown, but not Ratsoy, in finding no relationship between average and Estheticism. It supports Ratsoy in finding no relationship between average and Social Introversion or Professional Attitude. In the area of major subject field the present study is in agreement with Ratsoy's findings regarding the majority of science majors, on the

variables of Theoretical Orientation (higher), Estheticism (lower), Social Introversion (no difference), and Professional Attitude (no difference). It is not in agreement regarding Thinking Introversion, where Ratsoy found science majors in general to be lower; in the present study no significant difference was noted. Finally, in the area of preferred grade level, Ratsoy's findings coincide with those of the present study on the scales Thinking Introversion and Theoretical Orientation, on both of which secondary-school candidates in general scored higher, and on Social Introversion, where no difference was found. Ratsoy, however, found secondary-school-teacher trainees to score higher in general on Professional Attitude and lower on Social Introversion than elementary-school candidates, while the present study found no difference.

The similarities and differences in the various studies discussed may be attributed to many factors, chief among which is likely to be the fact that in many cases the samples are not directly comparable, either in size or in make-up. Even the sample used by Ratsoy (1965), which for reasons already stated was similar to that used in the present study, differed from the present sample in that it was far larger and more heterogeneous. Under these circumstances smaller differences may be statistically significant, resulting in a larger number of significant findings. Also, a heterogeneous sample often has more potential for variability. Nevertheless, a comparative view of the studies was

felt to be instructive, in that they made use of a largely common instrument in dealing with samples drawn entirely from college populations. These facts alone give them more in common than most studies in the area of personality change.

Possible Causative Factors

In a discussion such as the present one, some attempt must be made to delineate possible sources of various changes and differences which have been identified. As has been pointed out in the discussion of limitations of the study, no direct basis exists for comparison of the respondent group either with students in other faculties or with young people not attending university. Hence the effect of the program or the university environment cannot readily be determined. Nevertheless, some evidence in this area exists from at least one other study.

Ratsoy (1965) as part of his cross-sectional study of education students compared students in fourth year who had entered the Faculty of Education after obtaining a degree in another faculty, and students who had remained in the Faculty of Education for their entire program. He found that in general the latter group scored lower on Social Introversion and Theoretical Orientation and higher on Professional Attitude, while no difference existed on Thinking Introversion or Estheticism. This seems to suggest that an extended professional teacher training program does have an effect whether direct or indirect, on the first

three variables. Nevertheless, the possibility still exists that the personality differences which were found were in existence before the students ever entered their respective university programs, and hence are not a function of the program chosen. Perhaps the existence of certain predispositions even had an effect on which program they initially chose.

This possibility seems least likely in the area of Professional Attitude, where students would have relatively little conscious contact with policies of the teaching profession before entering their training program, and much conscious contact afterward. This is borne out as well by the fact that virtually all sub-groups showed an increase on this variable.

However, an additional finding by Ratsoy (1965) brings the effect of reference groups into focus. He found that experienced teachers scored highest of all sub-groups on Professional Attitude, which implies either that they are more familiar with professional policy, or that the policies of the profession are an expression of the feelings of teachers. In either case, the teaching profession can be identified as a reference group for those who aspire to membership in it. As such, it influences their behavior both directly, as regards their aspirations, and indirectly, as a focus for peer-group influence among their classmates. Hence the increase in Professional Attitude may be as much a function of the educational milieu as of the program

content itself.

Equally significant in a discussion of causation is Ratsoy's (1965) finding that no difference existed between educational students with a degree from another faculty and education students with an undergraduate background in education, on Thinking Introversion and Estheticism. This implies that the findings of the present study concerning a fairly general increase in Thinking Introversion and no change in Estheticism among education students, are not restricted to that group but are common to the whole university environment. Possibly, particularly in the case of Estheticism, the finding may be typical of the entire adult population, if the contentions of Harris (1966) and Burt (1967) are to be believed. These authors contended that the nature of esthetic response is established in childhood, and only over relatively long periods of time, and only in the formative years, is it likely to be changed significantly.

The causative effect of the biographic variables with respect to the observed changes has been discussed to some extent already. Nevertheless, it might well be pointed out that the relatively low intercorrelations among the biographic variables (see Appendix D) implies that in most cases the effect of the various variables are largely independent of one another. Exceptions might be age and marital status, which correlate at .43, sex and major subject area, which correlate at .38, and sex and marital status, which correlate at .34. All other intercorrelations are

below .30, which indicates relatively low interrelationship. In the cases where a high correlation is observed, a difficulty arises in determining which of the two related variables, if either, has greater influence. However, in the present study all intercorrelations are sufficiently low that for all variables a large part of their effect is independent of that of other variables.

Desirable Changes

Finally in a practice-oriented study such as the present one, some indication may be given as to which changes are likely to be more desirable in various teaching and teacher training situations, from a logical standpoint.

In the area of Thinking Introversion, it seems likely that an increased preference for abstract thought is to some extent a correlate of any university program, and hence must necessarily be a part of teacher training as well. The knowledge-seeking and thought-provoking functions of the university involve almost all students at some stage, and it follows that teachers, for better or for worse, often carry this mode of thought with them into the schools. At least for those teachers who deal with university-bound students, particularly those of creative bent, such influence can probably do no harm. In other areas it may not have much effect on the teacher-student relationship.

With regard to Theoretical Orientation, it appears that in an increasingly scientific and technological society a preference for scientific methods of thought is likely to

stand almost anyone in good stead. Particularly for those teachers who work with the sciences at any level an increased Theoretical Orientation is likely to be beneficial. For teachers in the humanities, the need may not be as acute; yet logical thought processes are required in all disciplines.

In the area of Estheticism, a higher level is likely to be beneficial in teachers who work with humanities, particularly the fine arts. Given the previously mentioned likelihood that esthetic response is largely established in childhood, a wide appreciation for the arts seems particularly desirable in those who would work with younger children.

In the area of Social Introversion, it seems logical that for those who are involved in working with others, as teachers are, a lower Social Introversion score is a desirable trait. This might be particularly the case in the pupil-oriented teaching of the elementary school; in the more subject-oriented atmosphere of the high school, teacher-pupil personal relationships are perhaps less important due to peer-group influences.

Finally, with regard to Professional Attitude, it seems logical that if teachers are to be professional people and are to get along with other members of their profession, a strong positive attitude toward the policies which teachers as a group espouse, is desirable. Since the profession is oriented by nature toward service to its clients, a strong positive professional attitude seems to be in keeping with the goals teachers and society at large hold

for education.

In general, however, it might be suggested that a balance among all of the above-mentioned traits is most desirable. No teacher works in total isolation either with a single subject or with a single type of pupil. A total lack of esthetic response even in a science teacher is not likely to be beneficial, any more than is a total lack of scientific thinking in an art teacher. Given the nature of human interaction, more than a single aspect of the individual's personality is influential in almost any situation, and hence no trait is unnecessary or ineffective in any individual.

SUMMARY

In this chapter, the findings of the study have been presented and discussed. Results were presented first for the whole sample of 105 students, then for different sub-groups of the sample based on a number of biographic variables. Both longitudinal and cross-sectional comparisons were made within and between the various sub-groups. Following the presentation of the results, a discussion was undertaken wherein the results were compared with each other and with the results of previous studies as described in Chapter 2. Both consistency and predictive power were discussed. The various findings were considered both longitudinally, in terms of change, and cross-sectionally based on the Year 4 results, in terms of differences within

the sample. Finally, a number of possible causative factors were suggested, and some indication was given of which personality traits and trait changes might be most desirable.

Chapter 5

SUMMARY, CONCLUSIONS, IMPLICATIONS

In this chapter the study is briefly summarized, a number of conclusions outlined, several possible implications of the findings given, and a number of suggestions for further research in the area made.

SUMMARY

The Problem

The present study sought to determine the existence of and the amount of change in several specific personality variables in prospective teachers examined in the first year and in the final year of their four-year preparation program. The personality factors measured were Thinking Introversion, a measure of interest in reflective thought and abstract ideas; Theoretical Orientation, a measure of interest in scientific activities and methods; Estheticism, a measure of preference for varied artistic matters and activities; Social Introversion, a measure of interest in relating to other people; and Professional Attitude, a measure of the degree of approval of policies of a teachers' professional organization. These five factors were chosen because of potential relevance to the teaching profession and the teacher training program.

The study was purely descriptive in nature, although the results of a number of other studies using the same instrument were summarized for the purposes of comparison. The main purpose of the study was to present, with a stress on possible practical applications, a picture of the prospective teacher in the process of and near the end of a four-year preparation program, with respect to the five personality variables mentioned. To help provide some detail, a number of biographic variables were included to provide a basis for examining certain sub-groups of the sample. These variables were: age at university entrance, sex, marital status at graduation, estimated socio-economic status of family, size of hometown, cumulative university average, major subject area, and grade level preferred in teaching. The intention was to examine the sample and the various sub-groups both longitudinally, to determine the nature and amount of change of the five personality variables over the four-year period; and cross-sectionally, particularly in the final year, to determine the differences which existed in various sub-groups of teachers entering the field.

The problem was formally stated as follows: "Which of the five personality variables undergo change as students pass through a four-year teacher preparation program, and what is the final result?"

The Sample and Data Collection

The sample consisted of the 105 students in the Faculty of Education at the University of Alberta who responded as first-year students to a questionnaire administered to virtually all students in the Faculty in the fall of 1964, and again as fourth-year students to the same questionnaire administered to virtually all fourth-year students in the Faculty in the spring of 1968. Only those students who had no teaching experience were included in the sample.

The Instrument

The instrument by means of which the data were obtained was a four-part questionnaire designed by Ratsoy (1965) to study attitudes of prospective teachers. The parts from which the information for the present study was obtained were: the section on biographic data; the twenty-item section based on professional policies of the Alberta Teachers' Association, from which the Professional Attitude score was obtained; and the section consisting of 160 true-false attitude and interest items, from which the scores on the remaining four personality variables were obtained. The Professional Attitude section was designed by Ratsoy (1965), while the other four scales are part of the Omnibus Personality Inventory developed by the Center for the Study of Higher Education, Berkeley (1962).

Analysis of Data

Since longitudinal comparisons of the same students in first year and fourth year were required for a study of personality change, and since cross-sectional comparisons were required for a study of the differences between sub-groups, two types of statistical analysis were employed. For the longitudinal comparisons for the whole sample and for the various sub-groups, the t-test for correlated samples was employed. For the comparisons between sub-groups at a given time, the Analysis of Variance was used, with the F-test being followed by the Scheffé "Comparison of Means Following an F-test" where more than two groups were being compared. These tests were preceded in all cases by preliminary tests for normality and homogeneity of variance, with appropriate corrections being made where these requirements were not met. The .05 level of significance was used throughout, except in the Scheffé test where increased rigour justified using a level of .10.

Results

A tabular summary of the results, both longitudinal and cross-sectional, may be found in Tables 10 and 11, pages 61 and 65 respectively.

The total sample. Longitudinal analysis on the whole sample revealed a significant change between Year 1 and Year 4 in mean score on Thinking Introversion, Theoretical Orientation, Social Introversion, and Professional

Attitude. The first two and the last increased, while Social Introversion decreased for the group as a whole. No change was found in Estheticism over the four-year interval. None of the five factors showed a significant change in variance of scores over the period.

Age in Year 1. Since age, naturally, is subject to change in a longitudinal study, the present study looked at the aspect of that variable which was not subject to change for the individual, namely the age at which the individual entered university. Younger entrants alone were found in general not to increase in Thinking Introversion or Professional Attitude, and to decrease in Estheticism. Older entrants alone tended to increase in Theoretical Orientation, while the middle age group was the only one to show a net decrease in Social Introversion. The only sub-group difference in Year 4 was a tendency for older entrants to be higher in Professional Attitude.

Sex. Both males and females tended to increase in Thinking Introversion and Professional Attitude, while males alone showed a general increase in Theoretical Orientation. In Year 4, males in general were higher in Theoretical Orientation and lower in Estheticism.

Marital Status. Single students alone tended to increase in Thinking Introversion and to decrease in Social Introversion. Married students alone showed a tendency to increase in Theoretical Orientation, while both groups

showed a net increase in Professional Attitude. In Year 4, married students as a group were significantly higher in Professional Attitude.

Socio-economic status. Those who perceived their socio-economic status to be lower than average alone tended to show an increase in Thinking Introversion and Theoretical Orientation; all socio-economic levels showed a net increase in Professional Attitude. In Year 4, respondents of lower socio-economic status showed a tendency to be higher than other groups in both Thinking Introversion and Theoretical Orientation.

Size of hometown. Relative rural-urban background showed an effect only on Thinking Introversion, where urban respondents alone did not show a general net increase. On Social Introversion, neither city nor rural respondents showed a net change, while students from a town background tended to decrease. On Professional Attitude, as usual, all sub-groups increased. No significant differences existed between the sub-groups in Year 4.

University average. Relative degree of academic success showed some relationship to Theoretical Orientation, where students with a higher average alone showed a net increase. On Thinking Introversion the middle group of "average" students was the only one not to increase. All academic levels showed a net increase in Professional

Attitude. In Year 4, students with higher averages tended to be higher in Thinking Introversion than "average" students but not than "below-average" students.

Major subject area. Longitudinally, mathematics-science students as a group were distinct from others only in their increased Thinking Introversion. Both groups showed a net increase in Professional Attitude. In Year 4, mathematics-science students were higher in general than non-mathematics-science students in Theoretical Orientation, and lower in Estheticism.

Preferred grade level. Those who preferred to teach senior grades were the only group to show a significant increase in Theoretical Orientation, while those who preferred junior high school were the only group not to increase in Thinking Introversion. All three sub-groups increased in Professional Attitude. In Year 4, those who preferred senior grades tended to be higher in both Thinking Introversion and Theoretical Orientation.

In general. Generally speaking whatever basis was used for dividing the sample, virtually all sub-groups increased in Professional Attitude, and virtually none showed any change in Estheticism. Most sub-groups increased in Thinking Introversion, but on seven of the eight biographic variables (sex being the exception) some basis existed for distinguishing between the sub-groups on net change in this

personality variable. That is, at least one sub-group showed no net change, while at least one showed a net change in each case. Theoretical Orientation, while showing a less general increase, also provided a basis for distinguishing between sub-groups on five of the eight biographic variables. Social Introversion changed in only three of twenty-one sub-groups, and the only biographic variable on which change in this personality variable could be consistently differentiated was marital status. Looking at the comparative results in Year 4, in Thinking Introversion level distinctions could be made between sub-groups created on the basis of socio-economic status, cumulative average, and preferred grade level. Theoretical Orientation level was distinguishable between sub-groups based on sex, socio-economic status, major subject area, and preferred grade level. Estheticism level could be distinguished between sub-groups based on sex and major subject area. Social Introversion level had little basis for distinction among the biographic variables examined. Finally, Professional Attitude level showed differences between sub-groups derived on the basis of age and marital status. Reference to the intercorrelations among the various biographic variables (Appendix D) may help to explain a number of commonalities in these findings. For example, the fact that age and marital status seem to affect the level of the same personality variables may be at least partly the result of a .43 rank-order correlation between these two biographic items. Likewise, the similar

functioning of sex and major subject area may be at least partly the result of a .38 correlation between them.

CONCLUSIONS

With reference to the problem, and on the basis of the results of the study, a number of conclusions may be drawn. First and most general is that personality factors of prospective teachers do change, for whatever cause, in the duration of a teacher training program.

More specifically, attitudes toward the teaching profession and its policies show a general and decided reinforcement which is not a function of any of the static variables used in the present study, but which appears to be at least partly dependent on the fact that the respondents were enrolled in a professional teacher training program (cf. Ratsoy, 1966).

Preference for abstract thought and ideas as well shows a fairly general increase, which gives some evidence of being as much a function of the university environment in general as of any other more specific variable. Nevertheless, a number of biographic variables do show a relationship, and in general this personality variable can be said to show greater increase for single persons of rural or small-town background and lower socio-economic status, who enter university at an older age and major in areas other than mathematics or science, achieving results either better or worse than average, and who prefer to teach at a level

other than junior high school.

A preference for scientific activities and methods also shows a general increase, but not as a function of the type of subject major. This variable shows the greatest increase for married males of lower socio-economic background and higher university average, who enter university when they are older, and who prefer a senior high school teaching position.

An interest in art and artistic activities is apparently fostered to virtually no extent in any group by either the teacher training program or the university environment in general. In fact, for those who enter university young, the likelihood is that their esthetic response will decrease.

In the area of relating to other people, a general but small increase occurs, particularly for students who come from a town background, enter university at eighteen or nineteen, and remain single.

In terms of the final comparative level of the various personality variables when the prospective teacher is about to enter the field, a number of tentative conclusions may also be drawn. First, those who prefer abstract thought and ideas to a greater extent tend to come from a lower socio-economic background, maintain a higher university average, and prefer to teach senior high school or university. Second, those who exhibit a greater liking for science and the scientific method tend to be males from a lower

socio-economic background, who major in mathematics or science and prefer to teach higher grade levels. Third, those who express a greater degree of interest in art and artistic activities tend to be females who major in an area other than mathematics or science. Fourth, those who evince greater agreement with the policies of the teachers' professional organization tend to be married students who enter university at an older age.

IMPLICATIONS

The results of this study may have implications for several groups, and for several levels of organization within the teaching profession. The fact that personality changes occur, and that personality factors have differential prevalence in different groups is significant in an organizational context, however, only if a consensus can be reached as to the desirability of the various factors. On an individual level, however, the applicability of these findings may be more direct.

A number of possible implications exist for those individuals and groups involved in teacher training. For example, the finding that the environment of neither the teacher training institution nor the university in general has any effect on esthetic response in students may prompt some rethinking of course requirements, or at least may stimulate some thought or experimentation among instructors.

Implications exist for those who hire teachers, in

that desired personality factors have been found to be more characteristic of some sub-groups than others. For example, if a superintendent feels that a high degree of agreement with professional policy is desirable in his teachers, he can more readily select those individuals who have a greater likelihood of evincing that characteristic.

Implications exist for the professional organization, which may in its activities take cognizance of the differing degrees of orientation to professional policy. As well, the organization may wish to take steps to ensure that the increase in agreement with professional policy which was generally evident in students passing through teacher training is likely to continue as the trainee enters the profession.

Implications exist also for the individual school staffs and administrators--the profession at a local level. Assignment of teachers to different grade levels and subject areas may be better made in accordance with perceived desirable characteristics. In-service training may concentrate on perceived shortcomings, taking into account the differences which have been found among sub-groups.

All of the suggested implications are concerned with practical application of the results of the present study in the teacher-training and teaching environment. This is in keeping with the orientation desired for the study. However, the implication also exists for the researcher that if the findings are to be applied, they must be publicized.

Furthermore, all of the suggested implications make the assumption that practice may be modified on the basis of the results of the present study. A further implication might be that, if the results of this study are found useful, a wider application of test instruments such as the one used in this study might serve a valuable purpose in gaining further practical knowledge.

One final implication exists, for the researchers who designed the instruments used in this study. The longitudinal findings, the restricted sample, the biographic comparisons may all serve to provide further information upon which refinements or new applications of the instruments may be based.

FURTHER RESEARCH

The present study is merely a small example of the type of research which might be undertaken, either with the present instrument or a refinement. A major area of needed research stemming from the present study is a more sophisticated longitudinal study, which through several repetitions of the questionnaire at different stages of professional training seeks not only the net changes but the stage in training at which they occur most rapidly, if any. Likewise, follow-up of the sample as they pursue teaching careers would serve to determine both the nature of further personality changes and the effects of present ones. An additional basis for comparison would also be obtained if a

study such as the present one were expanded to include students in other faculties, and persons not attending university, to determine more accurately the effect of the type of program on the various changes which occur.

A study such as the present one could also be replicated with a larger sample and/or a modified biographic data sheet, so that sub-groups of sub-groups could be compared, or more sophisticated statistical techniques could be used. For example, biographic data in interval form would permit the use of stepwise regression analysis to obtain more detailed results.

Further research using a greater number of personality variables or attitude scales could provide valuable information in areas not restricted to those represented by the five scales used.

Finally, even the data used in the present study have potential for further analysis. For example, a study of the nature of the changes which occurred could be made, in a manner similar to that done by Elton and Rose (1968). Or else a more detailed study of some of the biographic sub-groups could be made, using nonparametric statistical techniques where non-normality or smallness of sample size rendered parametric statistics inapplicable.

SUMMARY

The final chapter of the present study provided a summary of the entire piece of research, including problem,

sample, data collection, instrument, and results. On the basis of the results, a number of conclusions were drawn regarding the nature and possible causes of the various personality changes and differences. Among suggested causes were the general cultural milieu and previous experiences in it, the university environment, the students' educational program and experiences derived from it, and various individual biographic differences. On the basis of these conclusions, several possible practical applications of the findings were suggested, particularly to teacher training and placement. Finally, a number of suggestions were made for further research in the area of personality and personality change among education students and practicing teachers, an area in which the present study and those preceding it have only made a modest beginning.

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APPENDICES

APPENDIX A

PROFESSIONAL ATTITUDE SCALE

PART C

ATTITUDE INVENTORY II

DIRECTIONS: A number of controversial statements are given below. Indicate the degree of your personal agreement or disagreement with each statement by circling the appropriate number at the right.

CIRCLE 1—if you **agree strongly (AS)** with the statement.

CIRCLE 2—if you **agree somewhat (A)** with the statement.

CIRCLE 3—if you are **undecided (U)**.

CIRCLE 4—if you **disagree somewhat (D)** with the statement.

CIRCLE 5—if you **disagree strongly (DS)** with the statement.

| | AS | A | U | D | DS | |
|--|----|---|---|---|----|-----|
| 1. Schools should be granted greater local autonomy in curriculum building | 1 | 2 | 3 | 4 | 5 | |
| 2. Provincial teachers' associations should be able to discipline members for violating teacher ethics | 1 | 2 | 3 | 4 | 5 | /35 |
| 3. Curriculum guides issued by the Department of Education should specify methods to be used | 1 | 2 | 3 | 4 | 5 | |
| 4. School boards should be elected specifically to manage and administer the schools of the area and should be fiscally independent of municipal authorities | 1 | 2 | 3 | 4 | 5 | |
| 5. Increased federal aid for education should be provided | 1 | 2 | 3 | 4 | 5 | |
| 6. The curriculum authority of the Department of Education should be limited to matters of course objectives and minimum content | 1 | 2 | 3 | 4 | 5 | |
| 7. Provincial teachers' associations should be concerned with the competence of teachers | 1 | 2 | 3 | 4 | 5 | /40 |
| 8. Effective teaching can be done with more than twenty-five pupils per class | 1 | 2 | 3 | 4 | 5 | |
| 9. The local teaching staff should be consulted at all stages of the planning and designing of school buildings | 1 | 2 | 3 | 4 | 5 | |
| 10. Only those individuals who have teaching certificates should be appointed to the instructional staff of the Faculty of Education | 1 | 2 | 3 | 4 | 5 | |
| 11. The Alberta Teachers' Association should do everything in its power to maintain the right to strike | 1 | 2 | 3 | 4 | 5 | |
| 12. Teachers should accept as part of their responsibility the supervision of pupil deportment on school premises during noon intermission | 1 | 2 | 3 | 4 | 5 | /45 |
| 13. Selection of instructional methods should be a prerogative of teachers | 1 | 2 | 3 | 4 | 5 | |
| 14. Teachers should be paid according to a provincial salary scale | 1 | 2 | 3 | 4 | 5 | |
| 15. Provincial teachers' associations should have the right to recommend cancellation of a teacher's certificate | 1 | 2 | 3 | 4 | 5 | |
| 16. Membership in the provincial teachers' association should be compulsory for all teachers | 1 | 2 | 3 | 4 | 5 | |
| 17. Teachers should be paid on the basis of merit | 1 | 2 | 3 | 4 | 5 | /50 |
| 18. All teachers should be employed and paid by the provincial government | 1 | 2 | 3 | 4 | 5 | |
| 19. Teachers should decide whether or not they participate in or sponsor any particular extracurricular activity | 1 | 2 | 3 | 4 | 5 | |
| 20. Teachers should be compensated for time spent in curriculum writing | 1 | 2 | 3 | 4 | 5 | |

Continue on to page 8

APPENDIX B

TRANSFORMED DATA

Table 12
Raw Data Transformed for Computer Analysis
(see attached sheet for column contents)

| | | | |
|-------|-----------------------------------|-------------------------------------|-----|
| 33111 | 544222341442221223273913 | 31416121024492470246055752477135439 | 8 |
| 21252 | 5554123413324323321916312316 | 7 455356949436869496569335454 | 16 |
| 23112 | 1553124424434235233352328121512 | 8464569504645505035614453 | 17 |
| 21212 | 35541143522342344354517191121141 | 443436946455070696958356049 | 23 |
| 12142 | 44541145234233432222024261916 | 3 5454349423242370424943114843 | 32 |
| 11132 | 35551232355224523235431128131310 | 943434343506043494343115953 | 39 |
| 22112 | 5444115453233332324012 | 92118 3 643435549433250554332164950 | 43 |
| 52111 | 3422513554445442274424261615141 | 8322324645325045455032215146 | 52 |
| 21312 | 444421145443224242414312 | 41924222243454560435550606040344850 | 63 |
| 22122 | 455512561232345314354516151824101 | 136433643364936493649115544 | 77 |
| 22141 | 12441122423442452332830171511141 | 141046354636364845505036236239 | 82 |
| 22142 | 145512232552155234283920131923161 | 83543434343434649493943114842 | 87 |
| 21111 | 544211525347222244103531341312 | 81442352235424248353535114550 | 88 |
| 11211 | 335211435442255344203535321019 | 6 365255935435559574349114346 | 156 |
| 12111 | 14521145534234422444313122322191 | 442324332434543454632115353 | 158 |
| 22141 | 14221255133234324303323211313 | 31323252550242555506050126049 | 206 |
| 12221 | 342212325223422324423724172417 | 171342324649434946254949415254 | 219 |
| 21152 | 445712931443345333374117231827 | 71255675560635055495570335342 | 223 |
| 22342 | 245512552233443233745225212010 | 94343374343 339 339 3135958 | 231 |
| 32311 | 34221144534224423437445421723121 | 73222435323532353235116152 | 236 |
| 22112 | 25541245221234423440412216272121 | 2025494345425750574349155149 | 258 |
| 12251 | 1422123014423552022434252915 | 313134224392443 339 33924115453 | 259 |
| 22162 | 55551224033234341433291210211010 | 835433342424635423043115057 | 269 |
| 21142 | 4455123422423545344023621202227 | 7 150395035605570555039115247 | 270 |
| 22111 | 245211455334434442384127161010151 | 932354335434643464335115146 | 287 |
| 22162 | 1534123314422442343423414312 | 712132443242354637463243116153 | 294 |
| 24152 | 3555223414532245232454922332522 | 151635464646434250504643115651 | 300 |
| 24211 | 9422223252333437321618111716123 | 23224550495049504532116252 | 301 |
| 53212 | 44550322452255444323326211418111 | 143433950434350504349115347 | 304 |
| 22242 | 115551154253234523416252819161411 | 11355324336463655364336115147 | 310 |
| 22142 | 655561165244224523444433438263010 | 1039434345435043504270336356 | 316 |
| 21112 | 455511355442351434414316232430161 | 643435060505036504343116048 | 327 |
| 22141 | 12422124524423543222533015 | 9151313242424245045502424115949 | 354 |
| 12141 | 1522124523334733342829322910 | 61917323545454545454545114443 | 353 |
| 24142 | 34542034422344222343927411218161 | 643354235424955354335115645 | 363 |

Table 12 (continued)

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| 22152 | 3555125514522453334464622261917191243433949424655604346144749 | 372 |
| 11142 | 3455126414124223541947251115319339395546393955463946145560 | 377 |
| 11112 | 65451144544234434440261325232212043532246694569494358154437 | 383 |
| 21312 | 45651154444443344454233251224233749437449434350694343116454 | 385 |
| 21142 | 355512542442355334313325131520111339394235685560603939116048 | 412 |
| 24151 | 2434124413233433335033303120232211323323323323116039 | 417 |
| 22352 | 95551254143224413427353434131415154943394939493960116142 | 425 |
| 22112 | 6554116355423554342843157252351149434549464357462546115539 | 454 |
| 21112 | 644522245334444442402219102515101250254935433243494349115242 | 465 |
| 21152 | 34471277144223433433442225192791225433560436060704950115045 | 470 |
| 23212 | 4555125553333331436371220201819250434343465050506943316345 | 500 |
| 21152 | 555510321442245334474615132324181535436854394242703943115749 | 515 |
| 22162 | 11544113315423352323231211310121013394335049434943504360115144 | 516 |
| 21112 | 554512331444344533232429301112111039434339555550553943115145 | 602 |
| 22132 | 155512332542255322364328321917111242434346506550814243314849 | 612 |
| 33111 | 9442123354433443342223221913087434366843455454648134747 | 622 |
| 22152 | 35541264144345433446239111720161114434350555050696969335055 | 658 |
| 23141 | 35421234134233434274014111019615243535352448483535115640 | 663 |
| 22141 | 134212432412443324282419231412111043224339432525392539114537 | 667 |
| 43172 | 355422342443434464112212422105060045060060115037 | 702 |
| 21152 | 5555124314433453343535263219198643434649424974504349116050 | 708 |
| 21142 | 8455126524422552343643231722267939425558435069703942134645 | 710 |
| 22111 | 12422115453332234382422816171715352232503632363232115752 | 714 |
| 22112 | 145512341452145222450141517181717043057049050060414450 | 721 |
| RAL STOR 211455 | 135412302442243252302317221410111639256542394236743949115457 | 725 |
| 43111 | 952242465434433444264514182022121532323650454848604335215134 | 752 |
| 21142 | 445422423432343323141331017236639254250295542494242336053 | 766 |
| 22112 | 114241143544225533410251721101471222395049324350493239115149 | 779 |
| 22131 | 124221234343234235419142124751213323245354545454532115445 | 782 |
| 11152 | 2555124414222452333439131115224455436943695574555560316235 | 791 |
| 54271 | 1242252543552155442544516222224171435354932353649363536135350 | 792 |
| 21162 | 6355125213522343443353272726231212043042043043043516256 | 801 |
| 42312 | 3554223354432254344454034342421181643435055434960604355145346 | 820 |
| 12142 | 34551234244235533329349111518121343436060434677496043116245 | 821 |
| 22142 | 35551256244224224403119202216106043039046046039114050 | 826 |
| 12111 | 2322113452344412418162519887832354532324927493232115659 | 833 |

Table 12 (continued)

| | | |
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| 22142 | 35441245244233543322404226241310141439436042394342433943115646 | 836 |
| 22152 | 11554123314223453333834242320141317 036 055 025 058 036215746 | 860 |
| 22252 | 115441233145225433239351016211521172539364539494553343215852 | 864 |
| 22142 | 11544123322342344324203113121918101420434336394535583936114752 | 865 |
| 12242 | 33551233224444524495642361910131735426046434260754346115443 | 871 |
| 21112 | 655511335342224344333131625301219434345464650744249165145 | 875 |
| 24151 | 934222314422345343293516201210121439354654603549503635115745 | 876 |
| 33112 | 1655512345342344444293316131114 6 746494645464550604649464247 | 901 |
| 33172 | 655532542443345414374915122224101439434647554246493943116045 | 907 |
| 23152 | 445512421442345314302925222123 6 342436055504669594343115442 | 908 |
| 22112 | 445511635442354244262316171822 7 639434343434346493943115445 | 909 |
| 22142 | 115441240244245433222222121515101239437642354329493943115540 | 916 |
| 22332 | 245512401442040234515127212424242039 350 249 350 350 3134944 | 917 |
| 22141 | 343312422333443323531 0131316 91032325549323549465554465053 | 929 |
| 21152 | 6455126614423333272314181620 4 543394342695074504343115444 | 932 |
| 22162 | 554412651442324334302910151615101239434346434643943116850 | 939 |
| 23152 | 352422451442244242305036241628 7 224433545394937364236365246 | 952 |
| 22111 | 952211455442245342142641281314 6 5355932535354545492449125541 | 957 |
| 22112 | 24551164524224434446451215252412 942434358465349574343114449 | 958 |
| 51112 | 345551445442355444274325 91518 0 943434346554660495546314840 | 961 |
| 12142 | 35551276154224533440431511172110 639433553555546605539315251 | 965 |
| 22111 | 14221222333434234391317 018151725225036365438543636365151 | 970 |
| 22141 | 54522245233244314283222271518 3 6322353275323532603235615851 | 972 |
| 21162 | 554412342442243322213520222022 6 436552449436055464655135643 | 974 |
| 33172 | 255532455541154424254932241522 61343434343434669464343116038 | 977 |
| 23212 | 34522234255325433424213427191611 243557569466975694369135443 | 985 |
| 42142 | 356542362452255113655517152630101645434942494660464958155639 | 1006 |
| 21122 | 44551244142233331220333120232314 439394343395546584339115245 | 1016 |
| 21152 | 4444512321442334326252021151212101042434942505526694355134752 | 1019 |
| 22152 | 545512641442245334221422221313121035434345434355603939115743 | 1023 |
| 21142 | 55541232224422224313116151921 7 739395550555532685555335043 | 1027 |
| 22111 | 1422113554432454443333 0 9 815141635323545434345503550115145 | 1028 |
| 22111 | 344211445442345434317262316 7 81022324049324955463249145949 | 1032 |
| 22132 | 55551230434346336149 2 52124 913 055 055 055 055 055 055144447 | 1033 |

Column Contents for Table 12

| <u>Column</u> | <u>Contents</u> |
|---------------|---|
| * 1 | Age in Year 1 |
| * 2 | Sex and marital status in Year 4 |
| 3 | Birthplace |
| * 4 | Place where respondent completed grade twelve |
| 5 | Route |
| * 6] | Major subject area |
| 7] | |
| 8 | Number of courses in major field, Year 4 |
| 9 | Preferred grade level in Year 1 |
| *10 | Preferred grade level in Year 4 |
| 11 | Number of years away from school in Year 1 |
| 12 | Whether the respondent lives with parents in Year 4 |
| 13 | Cumulative average in Year 1 |
| *14 | Cumulative university average in Year 4 |
| 15 | Size of hometown |
| 16 | Socio-economic status of parents compared to teachers, Year 1 |
| 17 | Same, Year 4 |
| 18 | Socio-economic status of family compared to peers', Year 1 |
| *19 | Same, Year 4 |
| 20 | Teachers' education compared to parents', Year 1 |
| 21 | Same, Year 4 |
| 22 | Primary associates, Year 1 |
| 23 | Same, Year 4 |
| 24 | Amount of training anticipated prior to teaching, Year 1 |
| *25] | Thinking Introversion, Year 1 |
| 26] | |
| *27] | Thinking Introversion, Year 4 |
| 28] | |
| *29] | Social Introversion, Year 1 |
| 30] | |
| *31] | Social Introversion, Year 4 |
| 32] | |
| *33] | Theoretical Orientation, Year 1 |
| 34] | |
| *35] | Theoretical Orientation, Year 4 |
| 36] | |
| *37] | Estheticism, Year 1 |
| 38] | |
| *39] | Estheticism, Year 4 |
| 40] | |

| | |
|-------|--|
| 41] | Education Profession Aspiration Scale A, Year 1 |
| 42] | |
| 43] | Same, Year 4 |
| 44] | |
| 45] | EPAS B, Year 1 |
| 46] | |
| 47] | Same, Year 4 |
| 48] | |
| 49] | EPAS C, Year 1 |
| 50] | |
| 51] | Same, Year 4 |
| 52] | |
| 53] | EPAS D, Year 1 |
| 54] | |
| 55] | Same, Year 4 |
| 56] | |
| 57] | EPAS E, Year 1 |
| 58] | |
| 59] | Same, Year 4 |
| 60] | |
| 61 | Category of educational position aspired to, Year 1 |
| 62 | Same, Year 4 |
| *63] | Professional Attitude, Year 1 |
| 64] | |
| *65] | Professional Attitude, Year 4 |
| 66] | |
| 67-74 | Blank columns |
| 75-78 | Student Identification Number |

* Columns marked with an asterisk contain data used in the present study. More information regarding the contents of the remaining columns may be obtained from Ratsoy (1965).

APPENDIX C

NATURE OF THE PERSONALITY VARIABLES

The following are brief descriptions of the five personality variables. The first four are drawn from the Omnibus Personality Inventory --Research Manual (1962).

Thinking Introversion (TI): Persons scoring high on this measure are characterized by a liking for reflective thought, particularly of an abstract nature. They express interests in a variety of areas, such as literature, art, and philosophy. Their thinking tends to be less dominated by objective conditions and generally accepted ideas than that of thinking extroverts (low scorers). Extroverts show a preference for overt action and tend to evaluate ideas on the basis of their practical, immediate application.

Theoretical Orientation (TO): This scale measures interest in science and in scientific activities, including a preference for using the scientific method in thinking. High scorers are generally logical, rational, and critical in their approach to problems.

Estheticism (ES): The high scorers endorse statements indicating diverse interests in artistic matters and activities. The content of the statements in this scale extends beyond painting, sculpture, and music and includes interests in literature and dramatics.

Social Introversion (SI): The high scorers withdraw from social contacts and responsibilities. They display little interest in people or in being with them. The social extroverts (low scorers), on the other hand, seek social contacts and gain satisfaction from them.

Professional Attitude (PA): High scorers on this scale exhibit a greater degree of concurrence with the written policies of the Alberta Teachers' Association than do low scorers.

APPENDIX D

CORRELATIONS BETWEEN BIOGRAPHIC VARIABLES

Table 13

Significant* Kendall Rank Order Correlation
Coefficients between Eight Biographic
Variables**

| Variable name | Number | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------------------|--------|-----|-----|-----|-----|----|----|----|----|
| Age | 1 | .. | | | | | | | |
| Sex | 2 | -15 | .. | | | | | | |
| Marital status | 3 | 43 | 34 | .. | | | | | |
| Socio-ec. status | 4 | .. | .. | .. | .. | | | | |
| Size of hometown | 5 | -16 | .. | 19 | .. | .. | | | |
| Cumulative average | 6 | .. | .. | -19 | .. | .. | .. | | |
| Major subject area | 7 | .. | 38 | -18 | .. | .. | .. | .. | |
| Pref. grade level | 8 | .. | -29 | 17 | -20 | 21 | .. | 23 | .. |

*.05 level.

** Decimal points excluded in coefficients.

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